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METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

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A. Current Abstracts in English on important meteorological literature in every language.

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C. Selective, annotated bibliographies on subjects of immediate and special interest to meteorologists.

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METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

MALCOLM RIGBY, Editor

Vol. 9 MAY 1958 No. 5

SPECIAL FEATURE IN THIS ISSUE

Recent Literature on Physico-Chemical Oceanography

By
Mary L. Rice

(For complete table of contents see back cover)

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LIST OF PERIODICALS

Note: This list contains the titles of the periodicals which regularly contain material on meteorology or related fields and it comprises only a small percentage of the periodicals from which pertinent articles are abstracted. The form of serial entry adopted by MAB is given in bold face type below.

PERIODICALS IN WHICH METEOROLOGICAL ARTICLES REGULARLY APPEAR

★**Acta Geophysica Polonica,** [Warsaw].
Akademiia Nauk SSSR, Izvestiia, Ser. Geogr. and **Ser. Geofiz.,** [Moscow].
American Geophysical Union, Transactions, [Washington].
★**American Meteorological Society, Bulletin,** [Boston].
★**Angewandte Meteorologie,** [Potsdam].
Annales de Géophysique, Centre National de la Recherche Scientifique, [Paris].
★**Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A and Ser. B,** [Vienna].
Australian Journal of Physics, [Melbourne].
★**Australian Meteorological Magazine,** [Melbourne].
★**Ciel et Terre,** Société Belge d'Astronomie, Météorologie et Physique du Globe, [Brussels].
★**Geofisica e Meteorologia,** Società Italiana di Geofisica, [Genoa].
Geofisica Pura e Applicata, Istituto Geofisico Italiano, [Milan].
★**Geophysical Magazine,** Japan Meteorological Agency, [Tokyo].
Hemel en Dampkring, [The Hague].
★**Időjárás,** Magyar Meteorólogiai Társaság and Országos Meteorológiai Intézet, [Budapest].
★**Indian Journal of Meteorology and Geophysics,** [Delhi].
★**Journal of Atmospheric and Terrestrial Physics,** [London].
Journal of Geophysical Research, [Washington].
★**Journal of Meteorological Research,** [Tokyo].
★**Journal of Meteorology,** American Meteorological Society, [Boston].
★**Journal Scientifique de la Météorologie,** Société Météorologique de France, [Paris].
★**The Marine Observer,** Air Ministry, Meteorological Office, London.
★**The Meteorological Magazine,** Air Ministry, Meteorological Office, London.
★**Meteorologické Zprávy** [Prague].
★**Meteorological Society of Japan, Journal,** [Tokyo].
★**La Météorologie,** Société Météorologique de France, [Paris].
★**Meteorologiia i Gidrologiia,** [Leningrad].
★**Meteorologische Rundschau,** [Berlin].
★**Monthly Weather Review,** U. S. Weather Bureau, Washington, D. C.
Polarforschung, Archiv für Polarforschung, [Kiel].
★**Przegląd Meteorologiczny i Hydrologiczny,** [Warsaw].
Revista de Geofísica, Instituto Nacional de Geofisica, [Madrid].
★**Revista Meteorologica,** Junta Nacional de Meteorología, Montevideo.
★**Rivista di Meteorologia Aeronautica,** Servizio Meteorologico, [Rome].
★**Royal Meteorological Society, Quarterly Journal,** [London].
★**South Africa, Weather Bureau, Notos,** [Pretoria].
★**Tellus,** Svenska Geofysiska Föreningen, Stockholm.
Vsesoiuznoe Geograficheskoe Obshchestvo, SSSR, Izvestiia, [Leningrad].
★**Weather,** Royal Meteorological Society, [London].
★**Weatherwise,** American Meteorological Society, [Boston].
★**Wetter und Leben,** Österreichische Gesellschaft für Meteorologie, [Vienna].
★**WMO Bulletin,** World Meteorological Organization, [Geneva].
★**Zeitschrift für Meteorologie,** Meteorologisches Observatorium, Potsdam.

★ Indicates those periodicals which are primarily meteorological.

FOREWORD

Meteorological Abstracts and Bibliography is a monthly publication whose purpose is to bring to the attention of meteorologists current literature in their field and in related fields and to provide bibliographic information on various subjects, as interest demands.

Part I contains abstracts of current literature in the fields of meteorology, oceanography, etc., arranged according to the Universal Decimal Classification.

Part II of each issue comprises an annotated bibliography of important references on a special subject (usually arranged chronologically). No attempt is made to prepare exhaustive bibliographies; instead, the aim is to include a representative cross section of the various aspects of a subject.

Bibliographies published in the successive issues were:

Vol. I, 1950

1. Atmos. Pollution	2. Aerobiology	3. Cloud Physics	4. Hail
5. Tornadoes	6. Volcanic Dust	7. Climat. Changes	8. Thunderstorms
9. Icing	10. Acoust. Propagation	11. Evaporation	

Vol. II, 1951

1. Extended Forecast.	2. Long Range Forecast.	3. Soil Temp.	4. Constants, etc.
5. Clim. of Near East	6. Clim. of Middle East	7. Special Winds	8. Radar Storm Detect.
9. Condensation Trails	10. Clim. of N.E. Africa	11. Mountain Met.	

Vol. III, 1952

1. Clim. of N.W. Africa	2. Carbon Dioxide	3. Clim. of Argentina, etc.	4. Dew
5. Objective Forecast.	6. Stratus Forecast.	7. Urban Climatology	8. Clim. of C. Africa
9. Visibility	10. Glaze and Rime	11. Free Air Turbulence	

Vol. IV, 1953

1. Turbulence Theory	2. Turbulent Diffusion	3. Frost	4. Clim. of Australia, etc.
5. High Level Winds	6. Winds in Stratosphere	7. Jet Stream	8. Radiation Bioclim.
9. Clim. of Pacific	10. Auroras	11. Sferics	

Vol. V, 1954

1. Oceanog. Met.	2. Clim. of S.E. Asia	3. Auroral Physics	4. Tropopause
5. Balloons	6. Numerical Forecast.	7. Radiation Data	8. Vertical Motion
9. Clim. of Arctic	10. Industrial Met.	11. Wind Waves and Swell	

Vol. VI, 1955

1. Bibliog. of Bibliog.	2. Texts & Monogr. Bibliogs.	3. Storm Surges	
4. Ionospheric Prop.	5. Photochem.—Upper Atmos.	6. Cloud Physics	
7. Radar Cloud Physics	8–9. Atmos. Nuclei	10. Weather Modification	11. Cooling Power

Vol. VII, 1956

1. Synoptic Met.-Arctic	2. Clim. of Enclosed Spaces	3. Cosmic Rays (–1952)
4. Cosmic Rays (1953–56)	5. Atmos. Radioactivity	6. Inversions
7. Snow Micromet.	8. Snow Micromet. (Suppl.)	9–11. Tropical Cyclones

Vol. VIII, 1957

1. Solar Weather Relations	2. Night Airglow	3. Forecasting Special Elements
4. Forest Micrometeorology	5. Hydromet. Forecasting	6. Numerical Forecasting (Suppl.)
7. Albedo 8. Meteors	9–10. Tropospheric Propagation	11. Medical Meteorology

Vol. IX, 1958

1. Radioastronomy	2. Solar Astrophysics	3. Radioactivity in Atmosphere
4. Waves and Currents	5. Physical Oceanog.	

Other bibliographies in preparation are:

Actinometers	*Long Range Forecasting*	*Radar Meteorology*
Geomagnetism	*Mesometeorology*	*Singularities*
High Atmosphere Temperatures	*Ozone*	*Synoptic Aerology*

Part III contains a listing of reviews, translations, reprints, and the contents of important publications. These are published in the earliest issue where space permits.

Part IV is made up of author, subject and geographical indexes. The December issue comprises cumulative author, subject, geographical and journal indexes.

EXPLANATIONS

Location of material: For each entry, a symbol is given for at least one library where th material may be found. The Union List of Serials (Gregory) is the source of most of th symbols used. In some cases, where no symbol has been assigned to a library, one will b devised according to the principles of the Union List.

Library symbols used frequently may be found in the following list:

DA:	U. S. Dept. of Agriculture Library, Washington, D. C.
DBS:	U. S. Bureau of Standards Library, Washington, D. C.
DGS:	U. S. Geological Survey Library, Washington, D. C.
DLC:	Library of Congress, Washington, D. C.
DN-HO:	U. S. Navy Hydrographic Office Library, Suitland, Md.
DNLM:	U. S. National Library of Medicine, Washington, D. C.
DSI:	Smithsonian Institution Library, Washington, D. C.
DWB:	U. S. Weather Bureau Library, Washington, D. C.
GB-MO:	Great Britain, Meteorological Office Library, Harrow, England.
MH-BH:	Harvard University, Blue Hill Observatory Library, Milton, Mass.

Other symbols:

*	before an entry indicates a good data source.
†	before an entry indicates a good bibliography.
§	before an entry indicates a synoptic case history study accompanied by charts

Geographic locations are in the English form rather than the form used locally, for example Moscow for Moskva.

Titles of articles or monographs are in the language of the original article unless otherwis stated. Slavic (Cyrillic) titles are transliterated into the Roman alphabet according to th Library of Congress transliteration scheme.

Abbreviations:

Titles of periodicals are not abbreviated, as a rule.

The months of the year from March to July are not abbreviated. Other months ar abbreviated as Jan., Feb., Aug., Sept., Oct., Nov., and Dec.

The word or abbreviation for Volume (Tom, Band, Jahrgang, Año, etc.), for Numbe (Heft, Fascicule, Vypusk, etc.) and for page or pages is omitted from most entries. Thus a entry will read as follows:

Meteorologische Rundschau, 2(5/6):146–151, May/June 1950.

This indicates that the article appeared in *Meteorologische Rundschau*, *Jahrgang* 2 (Vo 2), *Heft* 5/6 (No. 5/6), *pages* 146–151, May/June 1950.

PART I. ABSTRACTS OF CURRENT METEOROLOGICAL MATERIAL

MAJOR GENERAL WORKS

NEW SERIALS

9.5–1 551.586(05)

International Journal of Bioclimatology and Biometeorology, Leiden, Holland, Vol. 1, **1957.** Quarterly (irregular). Pub. by the International Society of Bioclimatology and Biometeorology. Loose-leaf (sections issued irregularly to be inserted in hard covers with separaters for the 7 subject divisions). Subscription to members of the society, 15 Dutch guilders annually, from Editor (?) Hofbrouckerlaan 54, Oegstgeest, Leiden, Holland. Also: Sargent, Frederick, II (Dept. of Physiology, Univ. of Illinois, Urbana) **Bioclimatology (meeting Vienna, Austria, Sept. 23–27, 1957).** *Science,* Wash., D. C., 127(3290):155, Jan. 17, **1958. DLC.** Also: Undt, W., **Erster Kongress der "International Society of Bioclimatology and Biometeorology" vom 23. bis 27. September 1957 in Wien.** [First Congress of the International Society of Bioclimatology and Biometeorology, Sept. 23–27, Vienna.] *Wetter und Leben,* Vienna, 9(6/9):124–126, **1957. DLC.** Also: **Establishment of the International Society of Bioclimatology and Biometeorology.** *World Meteorological Organization, WMO Bulletin,* 7(1):40–41, Jan. **1957. DWB**—The new **International Journal of Bioclimatology and Biometeorology** is intended to cover summaries of completed bioclimatological studies, short reports on research in progress, critical reviews of special fields, a complete survey of world literature, summaries of symposia or congresses, information on dates and programs of symposia, reports from chairmen of the 5 scientific committees (Allergic Diseases, Ecological Climatography, Instrumentation, Ionisation of the Air, and Nautical Bioclimatology), etc., etc. Each volume corresponds to a discrete year and is divided into 7 parts, each part into several sections: 1. General bioclimatology; 2. Phytological bioclimatology; 3. Zoological bioclimatology; 4. Human bioclimatology; 5. Cosmic bioclimatology (blank); 6. Paleobioclimatology (blank); 7. Miscellaneous bioclimatological data. (For listing of these papers, *see* Pt. III of this issue of *MAB.*) The articles presented in the first volume (1957) are from the First Bioclimatological Congress of the International Society of Bioclimatology and Biometeorology, Vienna, 23–27 Sept. 1957. The program, members or attendants and their addresses, etc. are included in Pt VII of this volume. The large, loose-leaf format of this publication probably facilitates printing and distribution, but makes reading, cataloging and handling very frustrating. (For additional information, *see* 9.5–35 and 9.5–36.) *Subject Headings:* **1. Bioclimatological periodicals 2. Bioclimatological conferences 3. International Journal of Bioclimatology and Biometeorology 4. Serial publications. I. Tromp, S. W.** (*ed.*) **II. International Society of Bioclimatology and Biometeorology.**—*M.R.*

COLLECTED WORKS

9.5–2 550.3(08):551.506.2

Bates, D. R., (*ed.*), **The earth and its atmosphere.** N. Y., Basic Books, Inc., **1957.** 324 p. figs., photos, tables, bibliog. p. 303–308. **DLC** (QC806.B34)—The 17 chapters in this up-to-date collection of articles contain discussions by experts in the several fields of: 1) The IGY (S. CHAPMAN); 2) Origin and age of earth (KUIPER); 3) Earth's core (K. E. BULLEN); 4) Crust (J. T. WILSON), 5) Oceans (DEACON); 6) Magnetism (VESTINE); 7) Composition and structure of atmosphere (D. R. BATES); 8) Climate (EADY); 9) General circulation of atmos. and oceans (EADY); 10) Ice ages (ÖPIK); 11) Meteorology (B. J. MASON); 12) Ionosphere (RATCLIFFE); 13) Airglow (D. R. BATES); 14) Aurorae and magnetic storms (FERRARO); 15) Meteors (LOVELL); 16) Cosmic Radiation (J. G. WILSON); 17) Genesis of Life (HALDANE). Numerous illustrative graphs and schematic diagrams and tables are included. The information, while not presented in a technical style, is substantial enough to satisfy anyone who is not

an authority on the given subject. (For listing of contents, *see* Pt. III of this issue of *MA* articles abstracted separately.) *Subject Headings:* **1. Geophysics 2. International Geophysi Year, 1957–1958.**—*M.R.*

9.5–3 523.8(

†Conference on Stellar Atmospheres, Indiana Univ., Sept. 30–Oct. 2, 1954, **Proceedin** Marshal H. Wrubel, editor. [Indiana Univ. Foundation, **1955?**] 183 p. figs., tables, r throughout. **DWB** (523.82 W958c)—This volume contains 34 papers on observatio experimental and theoretical aspects of stellar atmospheres and other problems of astrophys In a few cases, an analogy can be maintained between the astrophysical and meteorologi relations (e.g., on p. 23–28, Frenkiel, F. N., **On the spectrum of turbulence in the photosph of the sun**), and the other papers on observational and spectroscopic methods on the chro sphere, etc. *Subject Headings:* **1. Stellar atmospheres. I. Wrubel, Marshal H.** (*ed.*) **II. Fr kiel, F. N.**—*M.R.*

9.5–4 551.525:551.579:631.4:581.14(

†*Joint Committee on Soil Tilth, **Soil physical conditions and plant growth, compiled the Joint Committee on Soil Tilth [of the] American Society of Agronomy [and the] Ameri Society of Agricultural Engineers.** N. Y., Academic Press, **1952.** 491 p. 97 figs., 65 tab extensive bibliogs. at end of each ch. Contents: Alexander, Lyle T. and Middleton, H. **Soil as a physical system,** p. 1–41. Lutz, J. F., **Mechanical impedance and plant grow** p. 43–71. Richards, L. A. and Wadleigh, C. H., **Soil water and plant growth,** p. 73–2 Russell, M. B., **Soil aeration and plant growth,** p. 253–301. Richards, S. J.; Hagan, R. and McCalla, T. M., **Soil temperature and plant growth,** p. 303–480. (*Agronomy, A Se of Monographs by the American Society of Agronomy*, Vol. 2.) **DWB** (631.43 J74s), **D** (S591.J67)—The subjects of soil moisture, soil aeration, and soil temperature and their fluence on plant growth are treated in great detail in this monograph which reviews the v literature on each of these fields. Under **Soil water and plant growth** the movement of wa and water vapor through saturated and unsaturated soil, water storage in soil, irrigati drainage, methods of measuring soil moisture, experiments with plants, wilting drou tolerance, efficiency of water use by plants, are among the many subjects covered. In chapter on **Soil aeration,** the relation of aeration to temp., water absorption, nutrients, pl diseases, root morphology and plant growth are treated. Under **Soil temperature,** the measu ment, factors affecting soil temp., cultural practices and physical and chemical relatio relation to growth processes, extreme temp. and plant injury or disease, and managem aspects are discussed. Extensive bibliographies accompany each chapter. *Subject Headi* **1. Soil textbooks 2. Soil temperatures and plant growth 3. Soil moisture and plant grow I. Shaw, Byron T.** (*ed.*).—*M.R.*

9.5–5 551.510.535:541.14:06

The threshold of space: the Proceedings of the Conference on Chemical Aeronor sponsored by the Geophysics Research Directorate Air Force Cambridge Research Cen Air Research and Development Command, Cambridge, Mass., June 25–28, 1956. Coordina by Wentworth Institute. Ed. by M. Zelikoff. Pub. N. Y., Pergamon Press, **1957.** 342 figs., photos, refs., eqs. **DLC**—About 200 scientists from many countries participated in t conference held at Cambridge, Mass., on June 25–28, 1956. The 45 papers are presen under 4 main heads: I. Atmos. photochemistry-earth and Venus; II. Spectroscopy and pho chemistry; III. Rocket probing of the upper atmos.; and IV. Phenomena produced by hyp sonic flight. Subjects concerning the airglow, ozone formation, water vapor photoly sodium emissions, and other aspects of photodissociation, recombination and chemical lu nescense in the high atmosphere as well as basic theoretical and laboratory studies are interest to meteorologists and aeronomists. (For listing of contents, see Pt. III of this is of *MAB*; all articles abstracted separately.) *Subject Headings:* **1. Upper atmosphere pho chemistry 2. Night airglow physics 3. Rocket spectroscopy 4. Hypersonic flight effe 5. Conference on chemical aeronomy. I. Zelikoff, Murray** (*ed.*) **II. U. S. Air Force. Ca bridge Research Center. Geophysics Research Directorate III. Wentworth Instit IV. Conference on Chemical Aeronomy, June 1956.**—*M.R.*

9.5–6 551.501(02)

†Linke, Franz, **Linkes Meteorologisches Taschenbuch.** [Linke's meteorological handbook.] New ed. Vol. 3, **Hiflsmittel des beobachtenden Meteorologen** [Aids to the meteorological observer], ed. by Franz Baur. Leipzig, Geest & Portig, **1957.** 441 p. 117 figs. (incl. photos), bibliogs. throughout. **DLC** (QC864.L53)—The six main headings in this, the third revised volume of the famous **Linke's Taschenbuch,** cover the following subjects: I. Basic units and formulas used in atmospheric radiation investigations, (FRITZ MÖLLER and FRIEDRICH VOLZ); II. Particular atmospheric-optic phenomena (by RUDOLF MEYER); III. Instruments and measurement techniques used in atmospheric electricity studies (by HANS ISRAËL and HANS DOLEZALEK); IV. Basic concepts and known facts in Bioclimatology (EMIL FLACH); V. Meteorological instruments used for measurements at the earth's surface (WALTER GRUNDMANN); VI. Aerological instruments (FRIEDRICH WOELFLE). Each section is a major and systematic review of up-to-date knowledge on the various aspects of the subject, and most sections contain extensive bibliographies (through 1956). An overall subject index is appended. In the introduction there is an eulogy to GÜNTER LOESER who began the preparation of sections V and VI, but who was killed in a helicopter accident on July 31, 1953 at O'Neill, Neb. Various chapters will be abstracted. (For v. 1, New ed., *see* 4.9–12, Sept. 1953; v. 2, New ed., *see* 5.3–8, March 1954, *MAB.*) *Subject Headings:* **1. Linke's Taschenbuch 2. Meteorological handbooks 3. Radiation constants 4. Optical phenomena 5. Atmospheric electricity instruments 6. Bioclimatology surveys 7. Meteorological instruments 8. Aerological instruments 9. Radiosondes. I. Bartels, Julius II. Dolezalek, Hans III. Flach, Emil IV. Grundmann, Walter V. Meyer, Rudolf VI. Boigt, Albert VII. Volz, Friedrich VIII. Woelfle, Friedrich IX. Israël, Hans X. Möller, Fritz XI. Baur, Franz XII. Loeser, Günter.**—*M.R.*

TEXTBOOKS

See also: **Canadian Arctic** (Clark), 9.5–27.

9.5–7 551.579(02)

*Chebotarev, A. I., **Gidrologiia sushi.** [Land hydrology.] Ed. by V. I. Uryvaev. Leningrad, Gidrometizdat, **1955.** 396 p. 137 figs., photos, 61 tables, 16 refs., 105 eqs. **DWB** (M79 C514gi)—Review by V. M. Pavlov in *Meteorologiia i Gidrologiia*, Leningrad, No. 6:67, June **1956.** Trans. into English of the Review, available for reference, **DWB** (627 P3384bo)—This edition of the standard text on hydrology of continental waters and land consists of 56 chapters divided among 8 major headings: 1) basic concepts and history, 2) the hydrologic cycle, 3) underground waters, 4) lakes, 5) bogs, 6) glaciers, firn, etc., 7) rivers and 8) river runoff and flood calculations and forests. It is based on the latest Russian concepts and research in hydrology and hydrometeorology and is intended for students and practicing workers in these fields. The text is full of data, charts, nomograms and other illustrative material of a practical nature. *Subject Headings:* **1. Hydrology textbooks 2. Hydrometeorological forecasting 3. Bogs 4. Lakes 5. Glaciers.**—*M.R.*

9.5–8 551.581:33(213)

†Lee, Douglas H. K., **Climate and economic development in the tropics.** Pub. for the Council on Foreign Relations by Harper, N. Y., **1957.** 182 p. 6 figs., 17 tables, 57 refs. **DLC** (HC59.L42). Review by B. H. Farmer in *Geographical Journal*, London, 73(3):395, Sept. **1957.** Review by Clarence A. Mills in *Science*, 126(3269):364, Aug. 23, **1957.** Review by J. B. Riggs in *Weather*, London, 13(2):68–69, Feb. **1958.**—This book arose out of a series of discussions held under the auspices of the Council of Foreign Relations on the general subjects of the effect of climate upon economic development in the tropics and the further knowledge needed in order to facilitate tropical development. The author discusses the nature of tropical climates, their classification according to the KÖPPEN and THORNTHWAITE systems and distribution of climates in the tropics; the effect of climate upon crop and animal production, including the effect of climate upon soils through disease, etc.; counteracting the deleterious effects of climate; social and institutional factors in underdevelopment of tropical countries; effect of climate upon human health and disease; and effect of climate on industry.

Subject Headings: **1. Climatic effects 2. Climate and economics 3. Climatic classificatio 4. Tropical climates.**—*I.L.D.*

9.5–9 551.593:551.594(02

Novikova, N. G., **Neobyknovennye nebesnye iavleniia.** [Unusual sky phenomena. 4th ed. Moscow, Gos. Izd-vo Tekhniko-Teoret. Lit-ry, **1953.** 63 p. 32 figs. (*Nauchn Populiarnaia Biblioteka*, No. 24.) **DLC** (QC975.N6 1953)—A popular pamphlet describin explaining and illustrating schematically a number of the more spectacular of the astronomic or atmospheric phenomena, such as the aurora, blood rains and fish rains, rainbows, corona halos, mirages, parhelia, comets, meteors, bolides, meteorites, solar and lunar eclipses, th Brocken spectre, etc. The work ends with the note that all phenomena observed in natu can be explained by natural laws and that there are no miraculous heavenly portents or sig such as were formerly believed. *Subject Headings:* **1. Atmospheric phenomena 2. Optic phenomena 3. Popular science books.**—*M.R.*

9.5–10 551.593(0

†Visser, Simon Willem, **Optische verschijnselen aan de hemel.** [Optical phenomena the sky.] *Netherlands. Meteorologisch Instituut, Verspreide Opstellen*, No. 3, **1957.** 135 67 figs., refs. English summary p. 128–132. **DWB.** "2d rev. and enl. ed. of his work b same title, published by N. V. J. Noorduyn in 1943."—A nicely illustrated monograph d scribing all of the forms of optical phenomena usually encountered in nature: 1) Theo (physics and geometry) of reflection, refraction, diffraction, interference and scattering light (especially sunlight); 2) observing methods and equipment; 3) optical phenomena gases (atmospheric); 4) in liquid water-drops: rainbows and coronas and 5) in solids (i crystals or dust). In this section halos of all types and Bishop's ring are discussed. Oth sections are: 6) the diffusion of light (blue of the sky, twilight phenomena, alpenglow, cr puscular rays, nacreous clouds and noctilucent clouds); 7) electrical phenomena (aurora, ai glow and St. Elmo's fire); 8) optical phenomena and the weather and 9) instructions for o servers. Several ancient illustrations of some of these phenomena, as well as modern glos photos and drawings and schematic diagrams, plus a subject index add to the value of th little book. *Subject Headings:* **1. Optical phenomena 2. Halo phenomena 3. Aurora** —*M.R.*

9.5–11 551.509.3:551.579:551.

Belinskiĭ, Nikolai Alekseevich, **Morskie gidrometeorologicheskie informatsii i prognoz** [Maritime hydrometeorological information and forecasting.] 2d ed. rev. Leningra Gidrometeorologicheskoe Izd-vo, **1956.** 253 p. 60 figs., 16 tables, eqs. **DLC** (QC994.I 1956)—The second edition of this manual or textbook on forecasting ocean waves, curren temperatures, freezing and thawing in Arctic, water and heat balance and ice movemen has been amplified and revised so that it contains 90 more pages than the first edition (195 New sections have been added to present statistical or empirical methods of calculating forecasting the water balance, calculating water temperature and location of ice in the op sea, the forecasting of water temp. in the N. Atlantic for autumn and winter, etc. Numero objective forecasting graphs and nomograms are included. Theory is not neglected. resume of the history of the marine forecasting service and the details of that service in t U.S.S.R. are presented. (For abstract on 1950 ed., *see* 3.2–46, Feb. 1952, *MAB.*) *Subj Headings:* **1. Oceanographic forecasting 2. Hydrologic forecasting.**—*M.R.*

9.5–12 551.589:551.509.31(

§†*Bugaev, V. A.; Dzhordzhio, V. A.; Kozik, E. M. et al., **Sinopticheskie protsessy Sredn Azii.** [Synoptic processes in Central Asia.] Tashkent, Izdatel'stvo Akademii Nauk Uzb skoĭ SSR, **1957.** 477 p. 170 figs., 161 tables, 296 refs. Added title page in Uzbek. head of t-p.: Akademiia Nauk Uzbekskoĭ SSR, Institut Matematiki i Mekhaniki. **DWB** Also: Akademiia Nauk Uzbekskoĭ SSR. Institut Matematiki i Mekhaniki, **Atlas tipichny sinopticheskikh protsessov nad Sredneĭ Azieĭ.** [Atlas of typical synoptic processes Central Asia.] Tashkent, **1954.** 1 p. text. 116 charts (in color) 42 × 31 cm. Loosele **DWB**—This substantial volume, together with the atlas of synoptic types of Central As

constitutes one of the best synoptic climatology or forecasting manuals ever published. It could be used for advanced courses in synoptic meteorology or for practicing forecasters. The 15 chapters written by the various authors cover the following subjects: 1) History and development of synoptic studies for Central Asia; 2) South Caspian cyclones; 3) Murgavskiĭ cyclones; 4) Upper Amu'darinskiĭ cyclones; 5) Warm air invasions; 6) N.W. cold air invasions; 7) Northerly cold air invasions; 8) Wave development in S. and S.E. Central Asia; 9) Slow-moving cyclones in N. Central Asia; 10) S.W. peripheral anticyclones over Central Asia; 11) Westerly intrusions; 12) Summer thermal lows; 13) Synoptic conditions for severe and unfavorable weather in Central Asia; 14) Climatic characteristics of cyclones and anticyclones in Central Asia; 15) Circulation factors influencing the climate of Central Asia. The charts in the **Atlas** corresponding to the "types" as represented by Ch. 2–13 are indicated in the introduction. The bibliography contains a list of nearly 300 references to synoptic studies of the region, scores of which were published between 1933 and 1956 in local or national journals by V. A. Bugaev (59 refs.), V. I. Gubin (13 refs.), V. A. Dzhordzhio (52 refs.), M. A. Petrosiants (9 refs.), N. N. Romanov (12 refs.), T. A. Sarymsakov (13 refs.), I. M. Iaroslavtsev (14 refs.) and others. Not only are there dozens of synoptic illustrations (charts, maps and schematic diagrams) but over 160 tables of analytical synoptic, aerological or climatic data representing the several synoptic types. Practical rules for forecasters are included in each chapter, and the balance between the theoretically and the empirically derived formulas or aids is maintained throughout the work. The **Atlas** presents a well analyzed series of colored surface (03 and 15 h) and 700 mb (+ thickness 500/1000 mb) synoptic charts chosen from examples corresponding to the types indicated in Ch. 2–13 of the manual, and are for the years 1944–51. Some of the charts cover all of Europe and Central Asia, whereas others are on a larger scale and cover only the area from the Volga to the western ranges of Sinkiang. *Subject Headings:* **1. Synoptic forecasting textbooks 2. Synoptic climatology 3. Forecasting manuals. I. Petrosiants, M. A. II. Pshenichnyi, A. Ia. III. Romanov, N. N. IV. Chernysheva, O. N. V. Sarymsakov, T. A.**—*M.R.*

MONOGRAPHS

See also: **Glacio-met. research, Greenland Ice Cap** (U. S. Corps of Engrs.), 9.5–25; **Antarctic expeditions** (Capurro), 9.5–30; **Aeronautical met.** (De Jong), 9.5–64; **Daily average met. data, Japan,** 9.5–97; **Rainfall intensities** (U. S. W. B.), 9.5–220, 9.5–221, 9.5–222; **Hydromet. data, Rio Grande,** 9.5–236.

9.5–13 551.58:681.177

Changnon, Stanley A., Jr., **First progress report, Illinois Cooperative Project in Climatology, Dec. 1, 1954–July 1, 1955.** A cooperative Project of the Illinois State Water Survey and the U. S. Weather Bureau. *Illinois. State Water Survey Div., Circular,* No. 51, July 1, 1955. 44 p. 2 figs., forms, 6 tables, foot-refs. **DWB.** Also: **Second Progress Report, July 1, 1955–June 30, 1956.** *Circular* No. 57, 1956. 24 p. 3 figs., 8 tables, 4 refs.—A project to put all climatological observations (from First Order and Cooperative Observers stations) in the state of Illinois onto punched cards was begun in Dec. 1954, and by June 30, 1955, records for 1901–1948 incl. had been processed for 11 stations, and by Jan. 1, 1956 it was expected that 20 stations would be completed (location shown on map of state). The details of instructions for editing and punching the various types of records (forms 1009, etc.) are given and the cards, codes, etc. shown in illustrations. Some of the uses made at the College of Agriculture of the Univ. of Illinois, of the limited number of cards available, are described. Rainfall records were particularly useful to the Water Survey Research Program. History of project, operational methods and procedures, etc. are treated. The second report states that by June 30, 1956, data were punched for 33 stations with records averaging 48 years in length (>560,000 cards, 1901–48), and 5 studies, making use of the cards (daily precip. frequencies, thunderstorm climatology, cloud census, upper air moisture vs. precip. and duration frequency of wet and dry periods) for Illinois were in progress. *Subject Headings:* **1. Punched card programs 2. Climatic records 3. Illinois. I. U. S. Weather Bureau II. Illinois. State Water Survey.**—*M.R.*

9.5–14 551.509:551.58

*Halstead, M. H., **Forecasting micrometeorological variables.** Texas. Agricultural an Mechanical College. Dept. of Oceanography and Meteorology, Contract AF 19(604)-1111 Final Report, March **1957.** 272 p. figs., tables, 14 refs., eqs.—Work was done betwee June 1, 1954 and May 30, 1957 at O'Neill, Nebr. (42°30'N, 98°34'W, 1980 ft). Sites an equipment are described and illustrated. The mobile station, telemetering circuits, desig of an analogue computer for prediction of micrometeorological parameters from surface cond tions and meteorological observations and the basic data are described, illustrated or presente Tests of the results of the summer program are discussed by way of evaluation of the syste for determining flux of sensible and latent heat from wind, temperature and dew point profile Air and soil temperature and moisture data are presented in tables and graphs. *Subje Headings* **1. Micrometeorological forecasting 2. Micrometeorological equipment 3. O'Nei Nebr.**—*M.R.*

9.5–15 551.515.3(766,78

Dickson, Don R., **Raw data report and [meteorological analysis of wind velocities various tornadoes] (final report).** Oklahoma. Agricultural and Mechanical College. R search Foundation, Contract Cwb-9115. (Unnumbered report), Aug. **1957.** 193 p. loos leaf, numerous photos. Mimeo. **DWB** (M15.3 041ra)—A voluminous report consisting ground and aerial photographs of tornado damage, and observer's analysis and eye witne reports of damage conditions, etc. during 5 tornadoes: 1) April 2, 1957 at Durant, Ardmo and Madill, Okla.; 2) April 22, 1957 at Kingfisher, Okla.; 3) April 25, 1957 at Holdenvill Okla.; 4) Cotton and Comanche counties, Okla., May 25, 1957 and 5) Kansas City, M May 20, 1957. At end of report is an analysis of wind speeds of 3 tornadoes in relation pressure differences on each side of a damaged structure. Winds were 160–175, >134.5, ar 185 mph, respectively, and all were cyclonic with pressure differences up to 79 mb. *Subje Headings:* **1. Tornado damage surveys 2. Tornado winds and pressure 3. Tornado, Kansa City (May 1957) 4. Oklahoma 5. Kansas City, Mo.**—*M.R.*

MANUALS AND HANDBOOKS

See also: **Linkes Met. Taschenbuch,** 9.5–6; **Forecasting manuals** (Bugaev), 9.5–12.

9.5–16 551.509:656.71(0

U. S. Air Weather Service, **AWS terminal forecast (TFAWS code),** Its *Manual* 105-2 April 1, **1957.** 10 p. 5 tables. "Supersedes earlier eds." **DWB** (M055 U58am)—A bri manual giving instructions for the preparation and dissemination of Air Weather Servi terminal weather and forecast reports. The TFAWS Code is used for transmission of cod forecasts of cloud, ceiling, visibility and weather for a terminal for a definite period. *Subje Headings:* **1. Terminal forecasts 2. Forecasters manuals.**—*M.R.*

9.5–17 551.509.58:551.576.1:629.135.2(0

U. S. Air Weather Service, **Forecast jet aircraft condensation trails.** Its *Manual* 105-10 April 1, **1952.** 17 p. 5 figs., form, 2 tables. Also: **Forecasting of aircraft condensation trail** *Ibid.*, 105-100, Aug. **1956.** 17 p. 5 figs., 3 tables, "Supersedes the April 1, 1952 issue of th Manual." **DWB**—In the April 1, 1952 issue, nomograms based on theoretical considerati of upper air temp. pressure and humidity are presented and discussed with respect to the use in forecasting contrails. The empirical verification of these charts is proceeding, wit apparent success indicated. In Sec. 1, the nature of various types of contrails and the operational importance is discussed. Sec. 2 deals with aerodynamic, Sec. 3 with engine e haust trails, and Sec. 4 with procedures for forecasting. Tables, overlay nomograms, et are appended. The Aug. 1956 issue is based on U. S. Air Weather Service Technical repor 105-103, -112, -126, -132, and -145, which cover research on contrails, derivation of curve results of Project Cloud-Trail, etc. Terms are defined, operational importance, forecasti from graphs and the accuracy of such forecasts, use of empirical contrail probability curv for jet and for propelled aircraft, respectively, are explained and the graphs presented. *Subje*

Headings: **1. Contrail forecasting manuals 2. Contrail probability nomograms 3. Jet aircraft condensation trails 4. Condensation trail forecasting.**—*M.R.*

GENERAL GEOPHYSICS AND METEOROLOGY

GEOPHYSICS

See: **The earth and its atmosphere** (Bates, *ed.*), 9.5–2.

IGY

See also: **Earth's atmos.** (Bates), 9.5–2; **IGY Antarctic program** (Doyen), 9.5–31; **IGY ozone networks** (Langlo), 9.5–38; **IGY bibliog.** (Embrey), 9.5–47; **IGY oceanog. program** (Böhnecke), 9.5–50; **IGY oceanog. program,** 9.5–51; **IGY satellite program in U.S.S.R.** (Krieger), 9.5–56; **IGY satellite program** (Newell), 9.5–57; **IGY whistler program** (Helliwell), 9.5–281.

9.5–18 550.3:061.3

Monges Lopez, Ricardo (*Dir. Inst. de Geofísica, Univ. Nacional de Mexico*), **El programa de Mexico para el Ano Geofísico Internacional.** [Mexican program for the International Geophysical Year.] *Mexico (City). Universidad Nacional. Instituto de Geofísica, Anales,* 2:113–131, **1956. DWB** (551 M6111an), **DLC** (QC801.M4)—The Mexican IGY programs in the dozen different disciplines is outlined and details as to directors in each field (Meteorology, A. Contraras Arias and E. M. Fournier d'Albe), the stations in the Mexican network (35 surface, 1 Rawin, 3 Raob, 8 Pibal), instruments (radiation equipment of 11 types), etc. are given. *Subject Headings:* **1. Mexican participation in IGY 2. Mexico.**—*M.R.*

9.5–19 550.3:061.3

Belousov, V. V. and Troitskaia, V. A., **Mezhdunarodnyĭ geofizicheskiĭ god.** [The International Geophysical Year.] *Akademiia Nauk SSSR, Vestnik,* 27(7):3–7, July **1957.** refs. **DLC**—One of 55 countries participating in IGY, the Soviet Union has 500 observing stations, 292 meteorological, 30 magnetic, 17 earth current, 34 auroral (23 new stations in Arctic) 200 visual auroral stations, 25 ionospheric, 6 meteor, 15 solar and 19 astrometric stations; 12 cosmic ray, 12 glaciological, 15 stations to study micro-seisms from typhoons and 6 tripartite seismic stations; seismic sounding expeditions to study earth's core in N.W. Pacific and 3 seismic stations in Arctic and 2 in Antarctic. World data center and "World Day" center for Eurasia are in U.S.S.R. The details of the center in Moscow for World Days and intervals, and of the centers for IGY data in different fields are given. Oceanographic work in Antarctic, the Antarctic stations and the fact that an American meteorologist is stationed at Mirnyĭ and a Soviet meteorologist at "Litl Amerika" is mentioned. *Subject Headings:* **1. Soviet participation in IGY 2. IGY networks.**—*M.R.*

9.5–20 551.506.2:550.3:061.3

Lugeon, Jean, **La participation de la Suisse à L'Année Géophysique Internationale, 1957–1958.** [Participation of Switzerland in the 1957/1958 International Geophysical Year.] *La Suisse Horlogère, La-Chaux-de-Fonds,* Switzerland, No. 42, Oct. 27, **1955.** unpaged reprint. fig.—The participation of Switzerland in the investigations of the 1957–1958 International Geophysical Year will be carried out, according to decisions of the Swiss National Committee of U.G.G.I., in two ways: 1) active collaboration in the world enterprise in Switzerland, in the following disciplines: Astronomy, radio-electricity, aerology, general meteorology, solar radiation, terrestrial magnetism, cosmic rays, atmospheric electricity, thunder storm activity, radiometeorology, hydrology, snow and ice; and 2) participation (a) in the international glaciological expedition in Greenland and (b) the establishment of a polar radio-meteorological station in very high latitudes, organized in common with several countries. Three locations have been found to be particularly favorable for this purpose: (A) Fridtjof Nansen Archipelago (Franz-Josef-Land); (B) Stations Nord (extreme N.E. coast of Greenland) and (C) Murchison Bay (north of Svalbard or Spitsbergen). *Subject Headings:* **1. Swiss participation in IGY 2. IGY, 1957–1958.**—*A.M.P.*

9.5–21 550.38:550.3:061

Hulburt, E. O., **Geomagnetic program of the International Geophysical Year.** *Scientif Monthly*, Wash., D. C., 83(2):87–91, Aug. **1956.** 5 figs. **DLC**—In an article describing th world-wide networks of magnetic stations and their operation, locations (shown on map world and detailed maps of U. S. stations in Alaska, Antarctica and the Pacific Ocean) ar U. S. plans for IGY, it is pointed out that maximum effort will be made to study the rap fluctuations in the geomagnetic field (as distinguished from the slow changes, or the spati variations in the permanent field) and that these studies require a denser network than found in Arctic and Equatorial regions where currents in the ionosphere must be studie during solar flares. Hence, satellite stations are planned for the region around Fairbank Alaska and in other critical regions. *Subject Headings:* **1. IGY geomagnetic program 2. Geo magnetic networks 3. Alaska 4. Antarctica.**—*M.R.*

9.5–22 550.3:061

Norwegian geophysicists engaged in wide range of IGY studies. *News of Norwa* Wash., D. C., 14(28):111, Aug. 29, **1957.** Account of meeting at Geilo to celebrate the 40 anniversary of the Norwegian Geophysical Society, established Aug. 20, 1917—the first its kind in the world. The society now has branches in Oslo and Bergen, and is engaged in wide range of research projects for IGY. Six million Kr is to be spent on this program. Th Meteorological Institute at Oslo will direct an expanded program of meteorological researc Two radiosonde stations will be established—one at Bear Island and one at Isfjord on Svalbar A 14 member expedition to Antarctica will be conducted by N. Polar Institute at 2′32″W 70′30″S. Auroral, oceanographic, cosmic ray, ionospheric and solar research will also b carried out. *Subject Heading:* **1. Norwegian participation in IGY.**—*M.R.*

9.5–23 550.3:061

Lugeon, Jean, **Les buts scientifiques de l'Expédition Radiométéorologique Polaire Suiss pendant l'Année Géophysique Internationale.** [Scientific purposes of the Swiss Polar Radi meteorological Expedition during the International Geophysical Year.] Reprint No. 2 from *La Suisse Horlogère*, May 16, **1957.** 16 p. 28 figs. (incl. photos). **DWB**—Plans f the IGY station at Murchison Bay by the combined expedition of Sweden, Finland and Switze land are described, with special reference to Swiss participation in research on atmospheric auroral and cosmic ray "noise" and atmospheric radioactivity. Charts show location station at Murchison Bay, Northeast Land, Spitzbergen, and alternate sites on nearby island Photos show the wealth of electronic equipment, recorder records and plan of quarters. Hi tory of Swiss Polar work along these lines is reviewed. *Subject Headings:* **1. Swiss participatio IGY 2. IGY radiometeorological program.**—*M.R.*

9.5–24 551.5:550.3:061

World Meteorological Organization, IGY 1957/1958 **Meteorological Data Centre Repor No. 1–10, April–Sept. 1957.** 10 pieces. paging varies. Contents: No. 1, **Summary of th IGY Meteorological programme and procedures.** No. 2, **Use of radiosonde balloons durin the International Geophysical Year.** No. 3, **Micro-opaque card readers.** No. 4, **Resul of the trial period for the International Geophysical Year.** No. 5, **Ozone and radiation ob servations.** No. 6, **Revised instructions for completing forms No. 2 and No. 2(b) durin the International Geophysical Year.** No. 7, **Microcards of IGY meteorological data.** No. **Atmospheric chemistry data.** No. 9, **Radiation observations.** No. 10, **Visual observation of aurora during the IGY. DWB** (M07 W927r). Also: **Microcards of International Ge physical Year meteorological data.** *Meteorological Magazine*, London, 86(1026):378, De **1957. DWB**—Details regarding the IGY data center which is developing at the WM secretariat at Geneva are outlined in the first of this series of reports—first on the objective organization, observations of various types, IGY calendar, checking and publishing of dat special forms; 2) handling of balloons for radiosondes; 3) microcard readers produced by va ous countries; 4) results of the trial period Jan. 6–10, 1957 which lead to improvement techniques: instructions (and samples) for completing IGY observation forms of various type 5) a list of radiation and ozone stations and methods of measuring and recording ozone a

radiation; 6) revised forms for use by stations, using tabulating machines with examples; and 7) details of arrangement of surface and upper air data on microcards, advantages and cost of a set, etc. The article from **Met. Mag.** is a summary of Report No. 7 of WMO-IGY data center. *Subject Headings:* **1. IGY meteorological program 2. IGY data center 3. Microcards for IGY 4. Microcard readers 5. Ozone networks.**—*M.R.*

ARCTIC RESEARCH

9.5–25 551.506.5:551.311.17(988)

*U. S. Corps of Engineers, **Greenland Ice Cap research program: studies completed in 1954.** Research and Development Reports prepared by U. S. Army Engineer Arctic Construction and Frost Effects Laboratory; Research and Development Labs., SIPRE, and Waterways Experiment Station. Pub. **1957.** 2 vol. Collection of reports, with individual paging. figs., photos, tables. **DWB** (919.8 U583g)—A number of reports on glaciological, ice trafficability and engineering research conducted in Greenland during the summer of 1954 are presented in Vol. 1. About 120 pages of raw (tabulated) data on snow density, hardness and associated parameters are appended. Vol. 2 contains meteorological and glaciological data obtained at 3 stations (1575–2410 ft) in the Thule area during the summer of 1954 (June 19–Aug. 29). Radiation, temp., humidity, wind, snow, ablation or accumulation, cloudiness, wind and temp. profiles above the ice, and a complete graphical and textual analysis of the data for each station, prepared by VALTER SCHYTT, are incorporated. Instrumentation of all types is described and illustrated in great detail. *Subject Headings:* **1. Glacio-meteorological research 2. Greenland Ice Cap 3. Thule, Greenland. I. Schytt, Valter.**—*M.R.*

9.5–26 551.593.1:551.524.7

Visser, S. W., **The Novaya-Zemlya phenomenon.** *Akademie van Wetenschappen te Amsterdam. Afdeeling voor de Wis- en Natuurkundige Wetenschappen, Proceedings of the Section of Sciences, Ser. B,* 59(4):375–385, **1956.** 3 figs., 6 tables, 9 refs., eqs. **DLC**—A lengthy demonstration of the geometrical optics which could explain the "Novaya-Zemlya phenomenon" observed on Jan. 24, 1597 by Dutch sailors wintering there—14 days before the sun should have appeared (4° below horizon). This and several other similar reports were hotly denounced for centuries, but KEPLER (1604) explained it as being caused by total reflection from a discontinuity in the upper atmosphere. This idea is shown to be basic to the possible explanation in terms of transmission ducts beneath inversions. These occur in the Arctic. Examples are cited and illustrated. Nomograms and tables for calculating magnitude of refraction under different conditions, graphs of inversion lapse rates over Siberia, and Greenland are also included and discussed. *Subject Headings:* **1. Novaya-Zemlya phenomenon 2. Inversion effects in Arctic 3. Abnormal refraction of light 4. Novaya-Zemlya, Soviet Arctic. I. Kepler, Johannes.**—*M.R.*

9.5–27 551.5(98)

Clark, W. Gilmour, **The Canadian Arctic.** *Weatherwise,* Boston, 9(2):61–63, April **1956.** photo. **DWB**—Notes on the actual weather and living conditions in Arctic Canada are presented in a popular article. Lowest temperature at Snag, Yukon was 81°F below zero. Extremes of 55° or 60°F are common, and rain has fallen in summer at the farthest north station (Alert, which is 500 mi from the Pole). Winds are persistent over the flat country but not as strong as some think. Snow is granular and accumulates in drifts. Joint U. S. and Canadian efforts in far north are emphasized—there are now 20 such stations, some with several years of record. *Subject Headings:* **1. Arctic weather 2. Arctic temperatures 3. Canadian Arctic.**—*M.R.*

9.5–28 551.574.1:628.8:551.586

Roberts, Palmer W., **Emergency, temporary, and semipermanent housing for polar areas.** (In **Dynamic North.** Wash., D. C., Technical Assistant to Chief of Naval Operations for Polar Projects, **1956.** Vol. 2, Pt. 6. 28 p. looseleaf. 6 figs. (incl. photos), 3 tables, 19 refs.) **DWB**—Problems of construction, heating and ventillating snow huts, tents, temporary, semipermanent, and permanent abodes in Arctic conditions are outlined and discussed. In-

sulation, vapor barriers, condensation control, sources of water vapor, etc. are included in discussion, with tables of thermal conductivities and resistivities and vapor transmission rates for various building material given in tables. *Subject Headings:* **1. Building construction 2. Condensation control in Arctic housing 3. Arctic.**—*M.R.*

9.5–29 551.462:551.43(98)

Migacz, Władysław (*Wrocław*), **Nowa mapa basenu arktycznego.** [A new map of the Arctic basin.] *Czasopismo Geograficzne*, Warsaw, 26(3):272–274, **1955.** 2 figs. **DLC**—Results of systematic investigations of the Arctic Basin carried out after the last war by Soviet explorers and scientists are outlined and discussed. Two bathymetric maps show how the knowledge of bottom topography of the Arctic Ocean has been changed by recent Soviet discoveries of the great underwater Lomonosov Range and of other mountain belts separating the individual depressions of the ocean's floor with mention of their corresponding depths. *Subject Headings:* **1. Arctic bottom topography 2. Arctic Ocean.**—*A.M.P.*

ANTARCTIC RESEARCH

9.5–30 551.506.5(99)

*Capurro, Luis R. A., **Expedición Argentina al mar de Weddell, Diciembre de 1954 a Enero de 1955.** [Argentine expedition to the Weddell Sea, December 1954–January 1955.] Buenos Aires, **1955.** 184 p. 20 figs. (incl. photos), maps, 8 tables, 8 refs. Text in Spanish, English and German. At head of t.p. Argentina. Ministerio de Marina, Dirección General de Navegación e Hidrografía. **DWB** (919 A691e)—This report contains an account of the status of the geographical knowledge of the Weddell Sea prior to the expedition here described; a description of the twin screw ice-breaker "General San Martín," used in the expedition, the track of the ice-breaker in the Weddell Sea, a description of the Weddell Barrier, the use of radar in the detection of icebergs and pack ice, a general description of the weather in the Weddell Sea from Dec. 30, 1954 to Jan. 22, 1955, radiosonde observations obtained during the expedition including air temperature at different isobaric levels, pressure, temperature and height of the tropopause, heights of different isobaric levels, and winds aloft for selected hours and days, oceanographic conditions in the Weddell Sea, including data on surface water temperatures, salinity and oxygen content, and a description of rocks and fauna. Photographs of ice conditions and numerous maps are included. *Subject Headings:* **1. Antarctic expeditions 2. Weddell Sea 3. Antarctica.**—*I.L.D.*

9.5–31 550.3:551.506.5:551.501.9(99)

Doyen, Paulette, **Les expéditions antarctiques au cours de l'été austral.** [Antarctic expeditions during summer in the Southern Hemisphere in 1955/56.] *Ciel et Terre*, Brussels, 72(7/8):347–364, July/Aug. **1956.** 2 figs., table. Also: Doyen, P. (*Asst. to Sécrétariat General, CSAGI*), **Les expéditions antarctiques au cours de l'été austral 1956/57.** [Antarctic expeditions during the southern summer of 1956/57.] *Ibid.*, Brussels, 73(3/4):191–210, March/April **1957.** map (fold). **DWB, DLC**—The first report states that during the 1955/56 summer season Australia, Chile, France, New Zealand, the U. S., United Kingdom and U.S.S.R. sent advance groups to the Antarctic whose task it was to establish bases to be used in the International Geophysical Year research program. Movements and activities of each of these advance groups are described in detail. As a result of these operations, six stations were established on the Antarctic continent. The second report is a revision, as of March 15, 1957, of the earlier summary of Antarctic expedition activities during the summer 1955–1956. It shows the progress made by expeditions of various countries participating in the IGY in the installation of scientific observation bases. It contains information on the work done by expeditions of Argentina, Australia (with a program for the 1956–1957 season), Chile, U. S. (containing information on ships, aviation and the stations: Amundsen-Scott, Byrd, Ellsworth, Wilkes, Cap Haliett), France, Great Britain, Japan, Norway, New Zealand and the U.S.S.R. (winter 1956, summer 1956–1957). One table gives mean monthly temperature of June for 5 stations; another lists 3 stations with the number of personnel (509 men on the Antarctic continent, 86 on Palmer Peninsula and the Pische Islands, and 15 on Macquarie Island). The program of installation and activities of the future Belgium station on Queen Maud Land is

discussed. *Subject Headings:* **1. Antarctic expeditions 2. IGY Antarctic program 3. IGY Antarctic stations 4. Antarctica.**—*G.T., A.M.P.*

9.5–32 551.506.5(99)

*Le Quinio, Robert, **Les observations météorologiques de Port-Martin en Terre Adélie 66°49′04″S–141°23′39″E—altitude 14 m, Pt. 4, Conditions atmosphériques en surface et en altitude de février 1950 à janvier 1952 (résultats complémentaires).** [Meteorological observations at Port-Martin in Adélie Land, Pt. 4, Atmospheric conditions at the surface and aloft from Feb. 1950–Jan. 1952: supplementary results.] Expéditions Polaires Françaises, Expéditions Antarctiques: Résultats Scientifiques, Ser. S.V. (Meteorology), **1956.** 97 p. 25 figs., 31 tables. **DWB**—Daily or hourly temperatures, pressure, wind, cloudiness, humidity, precipitation and visibility at the surface; temp., ascension rates and winds aloft from 139 radiosonde ascents in 1950–52 at Port-Martin, Terre Adélie and observations made on 6 "raids" during Aug. 1951–Jan. 1952 by F. Loewe, P. Perroud and other members of the expedition. Graphs, tables and frequency diagrams, soundings, etc. abound. *Subject Headings:* **1. Meteorological data 2. Expéditions Polaires Françaises 3. Port Martin, Adélie Land.**—*M.R.*

SERVICES AND SOCIETIES

See also: **Agromet. networks, Yangambi, Belgian Congo,** 9.5–70; **Thermobaric field analysis, Hungary** (Ozorai), 9.5–120.

9.5–33 551.501.9:551.509

Vietnam expanding meteorology facilities. *Aeronautical Engineering Review*, N. Y., 16(12):23, Dec. **1957. DLC**—A meteorological and geophysical center will be established at Tan Son Hoa near Saigon during 1957–1958. A radiosonde station, technical training course, instrument testing and repair shop, magnetic, seismic and actinometric observatory, and 7 substations, 5 meteorologic research and reporting ships, as well as the 26 new rainfall stations and 4 weather stations established in 1956–57 are listed. *Subject Headings:* **1. Saigon Geophysical Center 2. Vietnam meteorological network 3. Saigon, Vietnam.**—*M.R.*

9.5–34 551.501

Hagarty, J. H. (*Off. of Climat., U. S. W. B., Wash., D. C.*), **The cooperative Weather Bureau observer.** *U. S. Weather Bureau, Weekly Weather and Crop Bulletin*, 44(24):8, June **17, 1957.** photo. **DWB, DLC**—The U. S. W. B. now has >9000 cooperative observers. One observer, Harry Hawkins of Rock House, N. C., has been making daily observations for 66 years (Nov. 1891–date); H. H. Crisler of Port Gileson, Miss., from May 1891–Dec. 1954 (just before he died). Father Adelhelm Hess of Conception, Mo., completed 60 years of service and received a letter of commendation from Pres. Eisenhower. At Rome, Ga. four generations of the Tower family have made observations for almost 100 years, and George Richards of Maple Plain, Minn., has >60 years of service. *Subject Heading:* **1. Cooperative observers.**—*M.R.*

9.5–35 551.586:061.1/2(05)

Langlo, K., **Bioclimatology and biometeorology: creation of new international society.** *World Meteorological Organization, WMO Bulletin*, 5(4):154–155, Oct. **1956. DWB**—(See also similar articles by Frederick Sargent in *American Meteorological Society, Bulletin*, 37(10): 551, Dec. **1956** and *Science*, 124(3235):1299, Dec. 28, **1956.** First meeting of society (which was formed by initiative of S. W. Tromp of Netherlands on Jan. 1, 1956) was held at UNESCO House, Paris, 29–31, Aug. 1956, attended by 60 scientists from many countries. D. H. K. Lee of U. S. A. acted as chairman for the meeting. The purposes, the creation of an International Journal of Bioclimatology, and the members of the Executive Board are set forth. F. Sargent (U. S.) was elected president. The first congress will be held in Vienna in early Sept. 1957. (For additional information, *see* 9.5–1 and 9.5–36.) *Subject Headings:* **1. Bioclimatic conferences 2. International Society for Bioclimatology and Biometeorology 3. International Journal of Bioclimatology and Biometeorology.**—*M.R.*

9.5–36 551.586:574:061.2

Undt, W., **Internationale Gesellschaft für Bioklimatologie und Biometeorologie.** [International Society for Bioclimatology and Biometeorology.] *Wetter und Leben*, Vienna, 8(8/11):225–231, **1956. DLC**—This is a detailed account of the origin, organization and program of the newly organized "International Society of Bioclimatology and Biometeorology," which owes its origin to W. Troup (Netherlands). The author summarizes the aim of the association, the contemplated scope of a proposed **International Journal of Bioclimatology and Biometeorology** (*see* 9.5–1) and then lists the elected officers of the society. An accepted definition of bioclimatology and biometeorology is presented. Finally the papers delivered at the symposium held in Paris 29–31 Aug. 1956 are summarized. These included the following: **Action of aerosols** (H. Cauer), **Biological action of negative and positive ions** (H. K. Schultz), **Role of ions in bioclimatology** (W. Hicks and J. Beckett), **Organic chemical tests of possible cosmic ray effects** (Piccardi). Also the activities of bioclimatologists in different parts of the world are summarized. *Subject Headings:* **1. International Society for Bioclimatology and Biometeorology 2. Definitions.**—*I.L.D.*

CONFERENCES AND SYMPOSIA

See also: **Int. Journal of Bioclimat.**, 9.5–1; **Conf. on Stellar Atmospheres**, 9.5–3; **Conf. on Chemical Aeronomy**, 9.5–5; **Bioclimatic conf.** (Langlo), 9.5–35, (Undt), 9.5–36; **Gliding Congress, St. Yan, France**, 9.5–67; **Cloud Physics Conf.**, 9.5–209.

9.5–37 91:061.3:551.58:551.509.67

Hitchcock, Charles B., **The Eighteenth International Geographical Congress, Rio de Janeiro, 1956.** *Geographical Review*, N. Y., 57(1):118–123, Jan. **1957.** 5 foot-refs. Also: Mori, Alberto, **Il XVIII Congresso Internazionale di Geografia a Rio de Janeiro.** [18th International Geographical Congress at Rio de Janeiro.] *Società Geografica Italiana, Bollettino, Ser.* 8, 9(11/12):571–600, Nov./Dec. **1956. DWB, DLC**—In addition to listing the officers elected and other activities of the Congress, such as excursions, exhibits, etc., the author briefly reviews the various papers delivered at the meetings. Sixteen reports were delivered at the climatology sessions. These included a report on rainmaking in Puerto Rico (Leo Alpert), and correlation between rainy and dry seasons in the Sahara (J. Tricart). The second paper contains a report on the climatology section of the meeting (p. 586). *Subject Headings:* **1. Geographical congresses 2. Climatology 3. Artificial precipitation 4. Rio de Janeiro, Brazil.**—*I.L.D.*

9.5–38 551.510.534:08

Langlo, K., **Symposium on atmospheric ozone.** *World Meteorological Organization, WMO Bulletin*, 5(4):161–163, Oct. **1956.** photo. **DWB**—Symposium was held on June 25–28, 1956 at the Town Hall in Ravensburg, Germany, at invitation of International Ozone Commission (estab. by IUGG, Int. Assoc. of Met.) and organized by the Max-Planck Institut für Physik der Stratosphäre (in Weissenau). Prof. Bartels, Ramanathan, K. Langlo, S. Fritz and Dobson led sessions devoted to chemical methods of ozone determination, records, IGY networks, inspection of stations, Umkehr effect, etc. At present 50 Dobson instruments are in use in various parts of the world. *Subject Headings:* **1. Ozone symposia 2. IGY ozone network 3. Ravensburg, Germany.**—*M.R.*

9.5–39 551.586:63

Ontario Irrigation Conference [First], Ontario Agricultural College, Guelph, Feb. 23 **1956, Proceedings.** pub. Guelph, April **1956.** 32 p. tables.—Conference sponsored by Department of Agricultural Engineering. Ten papers are presented, dealing with such topics as the use of meteorological data in estimating irrigation, and frost protection for various cultures, ground water, evapotranspiration, etc. *Subject Headings:* **1. Irrigation 2. Frost protection 3. Agricultural meteorology 4. Ontario, Canada.**—*A.A.*

EDUCATION, HISTORY AND BIOGRAPHY

BIOGRAPHY

9.5–40 551.5:92

Bolin, B., **Carl-Gustaf Rossby in memoriam.** *Tellus*, Stockholm, 9(3):257–258, Aug. **1957.** port. **DWB, DLC.** Also: Bose, U. K., [**Obituary of**] **Carl-Gustaf Arvid Rossby.** *Indian Journal of Meteorology and Geophysics*, Delhi, 8(4):465, Oct. **1957. DWB, DLC.** Also: Flohn, H., [**Obituary note on**] **C-G. Rossby.** *Meteorologische Rundschau*, 11(1):1–2, Jan./Feb. **1958.** port. **DWB, DLC.** Also: [**Obituary note on**] **Carl-Gustav Rossby** in *Science*, Wash., D. C., 126(3271):444, Sept. 6, **1957.** Also: **Obituary of Prof. C. G. Rossby.** *Current Science*, Bangalore, 26(12):385, Dec. **1957.** Also: Sutcliffe, R. C., [**Obituary note on**] **C. G. Rossby.** *Royal Meteorological Society, Quarterly Journal*, 84(359):88, Jan. **1958. DLC.** Also: Sutcliffe, R. C. [**Obituary of**] **Prof. Carl-Gustaf Rossby.** *Meteorological Magazine*, London, 86(1026):373–374, Dec. **1957.** Also: Willett, Hurd C., **C.-G. Rossby, leader of modern meteorology.** *Science*, Wash., D. C., 127(3300):686–687, March 28, **1958.** Also: Van Mieghem, J., [**Obituary note on**] **Carl Gustaf Rossby.** *Ciel et Terre*, Brussels, 74(1/2):143–144, Jan./Feb. **1958. DLC.** Born Stockholm, Dec. 28, 1898; died Stockholm, Aug. **19**, 1957. *Subject Headings:* **1. Obituary of C.-G. Rossby 2. Rossby, C.-G.**

9.5–41 551.5:92

Roy, A. K., [**Obituary of**] **Dr. Irving Langmuir.** *Indian Journal of Meteorology and Geophysics*, Delhi, 8(4):464, Oct. **1957. DWB, DLC.** Also: Schaefer, Vincent J., [**Obituary note on**] **Irving Langmuir, versatile scientist.** *American Meteorological Society, Bulletin*, 38(8):483–484, Oct. **1957. DWB.** Also: [**Obituary note on**] **Irving Langmuir,** *Science*, Wash., D. C., 126(3271):444, Sept. 6, **1957.** Also: Hull, Albert W. (*Gen. Electric Co., Schenectady*), **Dr. Irving Langmuir's contributions to physics.** *Nature*, London, 181(4603):148–149, Jan. 18, **1958. DWB, DLC.** Also: [**Obituary note on**] **Irving Langmuir.** *General Electric Review*, Schenectady, N. Y., 60(6):7, Nov. **1957.**—Born 1881 in Brooklyn, N. Y. Died Aug. 17, 1957 at Falmouth, Mass. Ed. at Columbia School of Mines and Göttingen where he received doctorate in 1906. Worked with General Electric at Schenectady from 1909 until retirement in 1950. High vacuum diffusion pump, gas filled tungsten lamp, atomic hydrogen blow pipe for welding, surface chemistry (Mono-molecular layers) adsorption on metallic surface—Nobel Prize in 1932) and in last 10 years his work on rain making and warm cloud coalescence gave him a world-wide reputation altho in the case of his "rain making" theories there has not been general agreement among his colleagues in this field. *Subject Headings:* **1. Obituary of Irving Langmuir 2. Langmuir, Irving.**—*M.R.*

9.5–42 551.5:92

Carruthers, J. N., [**Obituary note on**] **H. U. Sverdrup.** *Royal Meteorological Society, Quarterly Journal*, 84(359):89–90, Jan. **1958. DLC.** Also: [**Obituary of**] **Harald Ulrik Sverdrup,** *Polar Record*, 9(58):57, Jan. **1958.** Also: Kirwan, L. P., [**Obituary note on**] **Professor Harald Ulrik Sverdrup.** *Geographical Journal*, London, 123(4):579–580, Dec. **1957. DLC.** Also: Bogdanov, D. V., [**Obituary note on**] **H. U. Sverdrup.** *Meteorologiia i Gidrologiia*, Leningrad, No. 12:57–58, Dec. **1957.** Also: Liestöl, Olav, [**Obituary note on**] **Harald Ulrik Sverdrup, 1888–1957.** *Journal of Glaciology*, 3(23), 226, March **1958.** Also: Ahlmann, H. W:son, [**Obituary note on**] **Harald Ulrik Sverdrup.** *Geographical Review*, 48(2):284–285, April **1958. DWB, DLC**—The many eloquent tributes to Prof. H. U. Sverdrup, director of the Polar Institute in Oslo at the time of his death on Aug. 21, 1957, attest to the universal love and respect held throughout the world by those who had known him personally, and the many outstanding contributions he made to oceanography, meteorology and glaciology since his work on the "Maud" Expedition (1918–25). He was Director of Scripps Institution of Oceanography at La Jolla, Calif. for 12 years before returning to Norway in 1948 to direct the Polar Institute. His work as a technical assistance expert to advise the fishermen of India is only one of the unusual activities that stemmed from his profound humanity. He was said to have made colleagues rather than subordinates out of his students. Sverdrup was born on Nov. 15, 1888 in Sogndal, Norway, attended the Univ. of Oslo, worked with V. Bjerknes from 1911–1918, succeeded V. Bjerknes at Bergen Geophysical Institute

1926/1931. Many of his other accomplishments and a bibliography of several hundred of hi works will be found in: Revelle, Roger and Munk, Walter, **Harald Ulrik Sverdrup—an ap preciation.** *Journal of Marine Research*, New Haven, Conn., 7(3):127–131, Nov. 194 Also: **Bibliography of Harald Ulrik Sverdrup,** (1914–1947), *Ibid.*, p. 132–138. **DWB, DLC** *Subject Headings:* **1. Obituary of H. U. Sverdrup 2. Sverdrup, H. U.**—*M.R.*

9.5–43 537.5:9

Rompe, Robert, **Rudolf Seeliger zum 70. Geburtstage.** [R. Seeliger on his 70th birth day.] *Annalen der Physik*, 6 Ser., 18(5/8):225–226, **1956.** photo. **DLC**—Aged 70 on Nov 12, 1956. Born Munich, moved to Berlin 1915, professor at Greifswald since 1918. His work covering all branches of electrical discharges in gases, is briefly described. *Subject Heading* **1. Biography 2. Seeliger, R.**—*C.E.P.B.*

9.5–44 551.5:9

Tammekann, A., **Emmanuel de Martonne.** *Terra*, Helsinki, 68(3):97, **1956. DLC**—Th professional career of DE MARTONNE and his contributions to geography are described. *Sub ject Headings:* **1. Obituaries 2. de Martonne, Emmanuel.**—*I.L.D.*

9.5–45 551.5:9

†Khrgian, A. Kh., **[Biographical sketch of] Mikhail Fedorovich Spasskiĭ.** Moscow Izd-vo Moskovskogo Universiteta, **1955.** 50 p. 3 refs. bibliog. of Spasskiĭ's works p. 49–5 (22 titles). At head of title page: Zamechatel'nye Uchenye Moskovskogo Universiteta. **DL** (QC858.S6K4)—A brief account of the life and scientific contributions of M. F. SPASSK (1809–1859) the distinguished Russian geophysicist of the nineteenth century, and of th state of the science of geophysics, including meteorology, in Russia during the first half of th nineteenth century. His major meteorological work was a study of the climate of Mosco which includes an analysis of atmospheric processes. *Subject Headings:* **1. Biography 2. Spas skiĭ, Mikhail Fedorovic.**—*I.L.D.*

9.5–46 551.5:9

Nezdiurov, D. F., **Vospominaniia ob Aleksandre Ivanoviche Voeĭkove.** [Recollections A. I. Voeĭkov.] (In: Budyko, M. I. (*ed.*), **A. I. Voeĭkov i sovremennye problemy klimatologi** Leningrad, 1956. p. 22–28.) **DWB**—D. F. NEZDIUROV specialized in meteorology as student at the University of St. Petersburg during the early years of this century. He de scribes VOEĬKOV's teaching and lecturing, his wide interest in various aspects of science, h realization of the possible use of radio in meteorology, his stimulation of research among h students and colleagues, his role in extending hydrometeorological observations in Russia Central Asia, his personal and social relations with friends and students, his contributions t military problems in World War I, his interest in cotton production, etc. *Subject Heading* **1. Biography of A. I. Voeĭkov 2. Voeĭkov, A. I.**—*I.L.D.*

BIBLIOGRAPHY

9.5–47 550.3:061.3:01

†Embrey, Lee Anne, **Bibliography for the International Geophysical Year.** *U. S. Nation Science Foundation, (Publication) No. NSF* 57-25, July 1, **1957.** 51 p. **DWB**—The gener program of the IGY is summarized, a list of 64 countries and of members of CSAGI and U. S. Committee and of various panels is presented and a bibliography of 600 items, arrange under a number of specific and a few general headings (such as historical background, c ganization, overall program, activities of other nations) is included. Most of the articles a of a nontechnical nature. By far the largest section is on **Rockets and Satellites** (about 2 items). A few items are included for each of the 11 special disciplines comprised in IG *Subject Headings:* **1. IGY bibliographies 2. Rocket and satellite bibliographies.**—*M.R.*

9.5–48 551.593.5:551.574

†Fishman, Myer M. (*City College of New York*), **Light scattering by colloidal systems: a annotated bibliography.** River Edge, N. J., Technical Service Laboratories, Jan. 195

4 p. **DLC** (Z5524.C7F5). Review by B. A. Brice in *Optical Society of America, Journal*, 7(10):977, Oct. **1957.**—Of the 858 briefly annotated references to literature on light scattering n hydrosols, polymers, proteins, aerosols, etc., there are several dozen references to literature n the theory, instrumentation, methods and (on p. 71–72) on aerosols. The section on theory p. 1–21) contains 238 references and is divided into 2 sections: 1) 1869–1943, and 2) 1944–956. Arrangement within each section is alphabetical by author. *Subject Headings:* **. Scattering by aerosols 2. Aerosol light dispersion bibliographies.**—*M.R.*

HISTORY

See: **Novaya-Zemlya phenomenon,** 1597 (Visser), 9.5–26.

PRACTICAL AND APPLIED METEOROLOGY

MARINE METEOROLOGY AND OCEANOGRAPHY

See also: **Oceanog. forecasting** (Belinskiĭ), 9.5–11; **New map of Arctic Basin** (Migacz), 9.5–29; **Gulf Stream and iceberg distribution forecasting** (Post), 9.5–60; **Sea level changes** (Pfannenstiel), 9.5–243; **Hot weather comfort** (Hamlin), 9.5–254; special bibliography on **Physical Oceanography,** p. 598.

9.5–49 551.48:581.11:551.510.4

Asaoka, O., **On the seasonal change of plankton diatoms around the Ocean Weather Station "X" (39°N, 153°E) in 1953.** *Journal of Meteorological Research*, Tokyo, 8(12):765–769, an. **1957.** 3 figs., table, 5 refs. In Japanese, English summary p. 765. **DWB, DLC**—Planktological and hydrographical observations were made by the ocean weather ships around 9°N, 153°E in the period from Jan. to Nov. 1953, and 330 cc of sea water was taken from each f 10, 25, 50, 100 and 150 m depths with buckets or Nansen bottles, and it was treated by using sedimentation method. (1) The number of diatom cells increases three times, Jan.–March, une–Aug. and Oct.–Nov. in that year. And in the former period the cell number appears in he upper 50-m layer in many cases. (2) The diatom species found in the upper 50-m layer elong almost to warm-water or cosmopolitan forms. In general, subgenus *Hyalochaete* is redominant in Jan.–Feb. while genus *Rhizosolenia* and subgenus *Phaeoceros* are prevalent in une–Aug. This seasonal variation of diatom communities is similar to that of those at nother Ocean Weather Station "T," 29°N, 135°E, located in the Kuroshio waters. However, ome cold-water species are more or less found in the depths lower than 50 m throughout the ear except Jan., and this fact means that the water in these lower depths is to some extent nfluenced by the cold Oyashio waters. *Subject Headings:* **1. Plankton diatoms 2. Seasonal lankton variations 3. Hydrography 4. Weather Ship "X" 5. North Pacific.**—*Author's bstract.*

9.5–50 550.3:061.3:551.46

Böhnecke, Günther, **Die ozeanographischen Arbeiten im Internationalen Geophysikali-chen Jahr (IGJ): Übersicht über die Planungen und Ziele.** [Oceanographic operations in he International Geophysical Year (IGY): an outline of their plans and aims.] *Deutsche Hydrographische Zeitschrift*, Hamburg, 10(2):33–38, **1957.** 2 figs. English and French ummaries p. 33. **DWB**—The following five main programs of worldwide oceanographic nvestigations will be carried out during the IGY 1957/58: 1) mean sea level, 2) long waves,) deep-sea circulation, 4) multiple ships measurements and 5) polar front survey. Their lans and aims are outlined. Some forty nations will be using sixty research ships, four undred coastal tide gages and forty wave recorders. The German Federal Republic par-cipates in the operations of the "Polar front survey" in the North Atlantic with their two esearch ships "Anton Dohrn" and "Gauss." *Subject Heading:* **1. IGY oceanography program.** *-Author's abstract.*

9.5–51 551.46:550.3:061.3

International Geophysical Year, 1957/58. U. S. National Committee. **Report on the urrent status of the international program in oceanography for the IGY.** Wash., D. C.,

National Academy of Sciences—National Research Council, May **1956.** 101 p. char
DWB (551.46 U58re)—A collection of excerpts from CSAGI reports and other documer
relating to the work of the oceanographic program for IGY. Letters and reports from
countries relating to their national programs in oceanography are included. Maps sh
locations of proposed expansion, ocean ships, network, cruises, research, etc. Stations a
listed and programs tabulated by countries. *Subject Headings:* **1. IGY oceanography progra
2. Oceanographic research during IGY 3. Weather ship networks.**—*M.R.*

9.5–52 551.46

Isaacs, John D. (*Scripps Institution of Oceanography, La Jolla, Cal.*), **Oceanography a
engineering.** *Journal of Marine Research*, New Haven, Conn., 14(4):323–332, **1955. DW
DLC.** Reprinted as *California. Univ. Scripps Institution of Oceanography, La Jolla, C
tributions*, 1955, issued July **1957.** p. 65–74. **DWB**—The need for greater exchange
scientific data and theories between oceanography and engineering is stressed in this rat
general talk on the value of interdisciplinary cooperation. Some specific instances are cited
which oceanography and engineering approaches to the solution of engineering problems a
contrasted. They involve the problem of wave refraction and wave damage. *Subject Hea
ings:* **1. Oceanography and engineering 2. Ocean wave refraction.**—*I.L.D.*

9.5–53 550.342:532.5

Stonely, R., **The communication of energy from ocean waves to the ocean floor.** *Pontif
Academia delle Scienze, Rome, Scripta Varia*, No. 12, **1952.** p. 390–393. fig. Reprint fr
its **La Semaine d'Étude sur le Problème des Microséismes,** pub. **1952. DLC**—Microseis
may be produced in a number of ways, but a review of several theories leads to the conclusi
that standing waves are the best generators of energy which may be communicated to t
ocean floor and thence to land seismic stations by the mechanism described. The standi
waves may be produced by reflection from a coast, by interference among the inward movi
components of progressive waves in a depression, or by interference of waves produced
opposing winds in a fast moving cyclone. The period will be one half that of the waves a
the energy would be proportional to the product of the wave amplitudes. Order of magnitu
of observed microseisms agrees with theory. *Subject Headings:* **1. Microseisms from standi
waves 2. Microseism theory.**—*M.R.*

ASTRONAUTICS

9.5–54 551.507.362.2:629.19 629

Fedorov, E. K. and Skuridin, G. A., **Rakety i iskusstevnnye sputniki zemli v issle
vaniiakh verkhneĭ atmosfery.** [Rockets and artificial earth satellites in upper atmosphe
research.] *Akademiia Nauk SSSR, Vestnik*, 27(8):37–48, Aug. **1957.** 6 figs. **DLC**—U
of rockets in upper atmos. research, problems presented in attempting to get back all of t
needed data (an instrument container is brought back to earth by means of a parachute
the Soviet rocket, as shown in illustration). Over a hundred rockets are proposed (for IG
to be launched from 3 points: 1) in Franz Josef land, 2) in mid-lat. European U.S.S.R. a
3) near Mirnyĭ station in Antarctica. The main part of the article describes and illustra
in detail the 3-stage rocket and the satellite proposed by the U. S. for Project Vanguard a
the scientific experiments considered for this IGY project. *Subject Headings:* **1. Roc
research 2. Satellite research 3. Soviet rocket 4. Project Vanguard.**—*M.R.*

9.5–55 551.507.362.2:629

Gustavson, John, **Soviet astronautics.** *Jet Propulsion, N. Y.*, 27(3):313–317, Ma
1957. DLC—A review of Soviet achievements, policies, and attitudes toward publicity in
field of space flight development, mainly based on the RAND Research Memorandum (R
1760), **A casebook on Soviet astronautics** (Pt. 1) by F. J. KRIEGER. The conclusion is t
the U.S.S.R. has a rocket technology and satellite development program whose potentialit
should not be underestimated. (For abstract of Pt. 2, *see* 9.5–56.) *Subject Heading:* **1. Sov
astronautics.**—*G.T.*

9.5–56 551.507.362.2:629.19

†*Krieger, F. J., **A casebook on Soviet astronautics, Pt. 2.** *Rand Corporation, Santa Monica, Project Rand Research Memorandum, RM-1922,* June 21, **1957.** 203 p. figs., tables, eqs. Bibliography of Soviet literature, p. 11–29. **DWB** (507.2 R186r)—The present status of Soviet progress in space flight technology is briefly reviewed on p. 1–10. Translations from the Russian, of papers on rockets and artificial satellites, are added as appendixes no. 1–16 (p. 31–203). The three articles of interest to meteorologists are: Poloskov, S. M. and Mirtov, B. A.: **Study of the upper atmosphere by means of rockets at the USSR Academy of Sciences,** p. 151–172. Nesmeyanov, A. N.: **The problem of creating an artificial earth satellite,** p. 189–196. Bardin, I. P.: **USSR rocket and earth satellite program for the IGY,** p. 197–203. Poloskov and Mirtov discuss present methods and activities in high atmosphere research and plans of future research, including rocket technique. The article by Nesmeyanov is from the newspaper **Pravda.** It mentions atmospheric research applications of satellites. Bardin summarizes the Russian program as presented at the CSAGI meeting in Brussels. *Subject Headings:* **1. Soviet astronautics 2. Satellite observatories 3. IGY satellite program in U.S.S.R.**—*G.T.*

9.5–57 551.507.362.2:550.3:061.3

Newell, Homer E., Jr., **Some preparations for the International Geophysical Year earth satellite program.** *American Geophysical Union, Transactions,* 38(4):450–456, Aug. **1957. DWB, DLC**—If all goes as planned, a number of small artificial satellites of the earth will be launched during the IGY. The IGY satellites will be launched by means of a finless three-staged rocket weighing about 11 tons. The satellites will be small, weighing on the order of 21.5 pounds. To make the utmost use of this small weight, the instrumentation must be miniaturized as much as possible, using such things as transistors and ferrite cores, and the most efficient power-supply systems obtainable. Nevertheless, there is a considerable list of worthwhile experiments that might be done in such a small satellite, including observations of solar radiation, cosmic rays, the earth's magnetic field, the ratio of radiation influx to the atmosphere to the radiation efflux, micrometeors and dust in space, the cloud cover over the earth, auroral particles, the density of the upper atmosphere, and geodetic parameters. The first four experiments have already been selected by the Technical Panel for the Earth Satellite Program to be attempted during the IGY. Since the last two listed require only careful observation of the satellite's motion, they will certainly be done also. The initial IGY satellites will open a new frontier of science, of engineering, and of man's achievement. The future possibilities of research from such space vehicles are exciting to contemplate, particularly in the light of possible increases in total payload weight, and increased flexibility in the choice of orbital inclinations and altitudes. *Subject Headings:* **1. IGY satellite program 2. Satellite observatories.**—*Author's abstract.*

GLACIER ICE AND SEA ICE

See also: **Glacio-met. research** (U. S. Corps of Engrs.), 9.5–25; **Radiation instruments** (Hoinkes), 9.5–110; **Glacial ablation data** (Peguy), 9.5–207.

9.5–58 551.311.12

Ambach, W., **Zur Bestimmung des Luft- und Schmelzwassergehaltes des Gletschereises.** [On the determination of the air and melt-water content of glacier ice.] *Zeitschrift für Gletscherkunde und Glazialgeologie,* 3(3):297–304, **1956.** fig., 2 tables, 10 refs., 5 eqs. German and English summaries p. 302–303. **DLC**—Melting glacier ice consists of compact ice, enclosed air bubbles and melt water. The air content is computed from ice density and melt-water content (which made little difference); density on Hintereisferner at 2600 m, July–Aug. 1955, varied from 0.857 to 0.911, mean 0.886; air content 0.9 to 6.8%. The cooling down of ice on radiation nights, measured by thermocouples, gave the water content as roughly 1–3%. The freezing of this on radiation nights is a considerable source of heat. *Subject Heading:* **1. Glacier ice.**—*C.E.P.B.*

9.5–59 551.578.46:551.311.12

Hoinkes, H., **Die Bedeutung des aufgefrorenen Eises (superimposed ice) für die Entstehung von Kryokonitlöchern.** [The importance of superimposed ice for the formation of cryoconite holes.] *Zeitschrift für Gletscherkunde und Glazialgeologie*, 3(3):305–312, **1956.** 7 figs., 11 refs. German and English summaries p. 311. **DLC**—Superimposed ice forms in spring by the refreezing of meltwater from the winter snow cover on the cold glacier surface. It is penetrated by chains of air bubbles normal to the glacier surface, and these facilitate the formation of sharp-edged cylindrical holes several times deeper than their diameter. These cryoconite holes are particularly developed in glaciers of polar regions. *Subject Headings:* **1. Cryoconite holes 2. Ice melting.**—*C.E.P.B.*

9.5–60 551.465:551.311.17:551.509.3(263)

Post, Louis A. (*U.S.N. Hydrographic Office, Wash., D. C.*), **The role of the Gulf Stream in the prediction of iceberg distribution in the North Atlantic.** *Tellus*, Stockholm, 8(1):102–111, Feb. **1956.** 7 figs., table, 11 refs. **DLC**—A twenty-six year correlation is made between the yearly frequency fluctuations of icebergs south of the 48th parallel and the preseasonal sea surface temperature anomalies at Key West in the Straits of Florida and those of the Labrador Current three years later. Good agreement among these variables is attributed to (1) the immediate effect of the relative strength of the Gulf Stream in barring the southward flow of bergs, and (2) the effect that varying strength of the Gulf Stream has upon the volume of warm water that escapes to the north, the effect in turn upon the rate of transport of icebergs, and the potential number eventually to be carried into the shipping lanes. An iceberg prediction table is offered, making possible a prediction for the current year by using the sea temperature anomaly at Key West for March of this year together with the anomaly of three years earlier. "The opinions and assertions contained herein are the private ones of the author and do not reflect the views of the Navy Department or the Naval Establishment." *Subject Headings:* **1. Gulf stream effects 2. Iceberg distribution 3. Iceberg forecasting 4. North Atlantic.**—*Author's abstract.*

9.5–61 551.311.181:778.3

Suzuki, Yosio (*The Institute of Low Temperature Science, Hokkaido Univ.*), **Observations of ice crystals formed on sea surface.** *Oceanographical Society of Japan, Journal*, 11(3):123–126, Oct. **1955.** 13 figs. (incl. 12 photos), 3 refs. **DWB.** Also in *Low Temperature Science, Sapporo, Japan, Ser. A., Physical Sciences*, 14:151–153, **1955.** 4 figs. (incl. photos), 5 refs. In Japanese. **DWB, DLC**—It is well known that at the beginning of the freezing process of sea water small ice crystals are formed on its surface. Observations of such ice crystals in laboratory have been made by several authors using microscopic photography (Fukutomi, Nagashima and Kusunoki 1949) and shadow photography (Arakawa and Higuchi 1954; Arakawa 1955). However, as far as the present writer is aware, photographs of ice crystals on natural sea surface have not been published up to now. In the course of the Sea Ice Expedition at Monbetsu (on the Okhotsk Sea coast of Hokkaido) in Feb. 1955, the writer tried to take photographs of ice crystals *in situ* conditions using polarized light source and polaroid filter. In this short report, the method and results of that attempt are described. *Subject Headings:* **1. Freezing of seas 2. Photography of ice crystals.**—*Author's abstract.*

GEOMAGNETISM

See also: **IGY geomag. program** (Hulburt), 9.5–21.

9.5–62 532.5:550.383

Hide, Raymond (*Cambridge Univ., England*), **Fluid motion in the earth's core and some experiments on thermal convection in a rotating liquid.** *U. S. Office of Naval Research, Proceedings of the First Symposium on the Use of Models in Geophysical Fluid Dynamics, Sept. 1953*, pub. **1956.** p. 101–116. 12 photos., tables, 42 refs., eqs. **DWB, DLC** (QC809.F5U5)—Model experiments with equipment analogous to Fultz's Rotating Dishpan models are described and illustrated to show how observed changes (drifts) in geomagnetic field can be explained by hydrodynamic theory and experiment. In this case the liquid (water) with

convection induced by heating or cooling, gives results which are applicable to a fluid such as is postulated for the earth's core, qualitatively following the same laws worked out for the atmosphere or ocean: long waves, cells, jet streams, spiral and wave patterns depending on critical values of the Rossby number (R_0). *Subject Headings:* **1. Rotating dishpan models 2. Geomagnetic field change models.**—*M.R.*

9.5–63 538.3

Okhotsimskaia, M. V. (*Alma-ata Geophys. Station*), **Sezonnoe raspredelenie korotkoperiodicheskikh kolebaniĭ elektromagnitnogo polia zemli.** [Seasonal distribution of short period oscillations of the terrestrial electromagnetic field.] *Akademiia Nauk SSSR, Izvestiia, Seriia Geofizich.* No. 8:999–1000, Aug. **1956.** 3 figs., 2 refs. **DWB, DLC.** Trans. into English by E. R. Hope, issued as *Canada. Defence Research Board, T-228-R,* Sept. **1956. DWB**—The author discusses two of the most frequently encountered variations of terrestrial electromagnetic field, namely I and II, in connection with the seasonal aspects of the positions of the earth and sun. Recordings of the terrestrial electromagnetic field variation made at the Alma Ata Geophysical Observatory during Sept. 1953–Aug. 1954 were used. Figures of the Type I and II oscillations and of the annual variations of the oscillations are given. The maximum frequency is associated with the equinoxes and the minimum with the solstices. The annual curve is explainable in terms of the sunspot distribution and the characteristics of the mutual inclination of the solar and terrestrial equatorial planes. *Subject Headings:* **1. Terrestrial electromagnetic field variations 2. Alma Ata, Kazakhstan.**—*I.L.D.*

AERONAUTICAL METEOROLOGY

See also: **Contrail forecasting manuals** (U. S. A. W. S.), 9.5–17; **Shock waves from jet planes** (Hawkes), 9.5–195; **Bad flying weather, Gander** (Johns), 9.5–262; **Visual flight rules** (U. S. W. B.), 9.5–267; **Elec. charges on aircraft** (Imianitov, Kolokolov), 9.5–271; **Elec. charges on aircraft** (Chapman), 9.5–276.

9.5–64 551.5:629.13

De Jong, H. M., **Theoretical aspects of aeronavigation and its application in aviation meteorology.** *Netherlands. Meteorologisch Instituut, Mededeelingen en Verhandelingen,* No. 64, **1956.** 123 p. numerous figs. and eqs., 17 refs. **DWB** (M055 N469m)—The basic theory of navigation in a stream, and particularly in an air current, is thoroughly treated from a historical as well as a utilitarian point of view. Then the principles of pressure-pattern flying, single heading navigation, minimal flight path, variations, extremals, etc., with examples from North Atlantic navigation (Holland-New York). Applications to meteorology are cited. Such details as refraction (Von Mises), reflection, time fronts, the indicatrix, etc. are treated at length with many schematic illustrations. This is a well edited and nicely printed reference work or text. *Subject Headings:* **1. Aerial navigation textbooks 2. Single heading flights 3. Aeronautical meteorology.**—*M.R.*

9.5–65 551.510.5:541.14

Hansen, C. Frederick (*NACA*), **Some characteristics of the upper atmosphere pertaining to hypervelocity flight.** *Jet Propulsion,* 27(11):1151–1156, Nov. **1957.** 13 figs., 16 refs. **DLC**—The chemical processes which occur in the air are discussed relative to their effects on the density and temperature of the atmosphere. The reactions responsible for most of the solar energy absorption are outlined, along with the major rate controlling reactions which determine the atmosphere's state of chemical equilibrium. It is demonstrated that because of the low density most of the aerodynamic force and heat transfer effects become secondary above 60 miles altitude, for vehicles traveling at speeds up to escape velocity. Meteor and cosmic particle problems and other hazards which arise at high altitude are considered with relation to flight. It is concluded that these hazards will probably not prohibit manned flight through the upper atmosphere. *Subject Headings:* **1. Upper atmosphere physics 2. Photochemical reactions in upper atmosphere.**—*Author's abstract.*

9.5–66 551.506.1:629.13

*International Civil Aviation Organization, **Progress Report No. 3 on Meteorological and climatological summaries for aerodromes serving international air operations.** Its *Doc. 7666,*

MET/527, Feb. 29, **1956.** 9 p. tables. **DWB** (M06.1 I61p)—The airports in 28 countrie which have published aeronautical meteorological summaries according to ICAO standard since the second Progress Report of this series, are listed and the periods for which data ar available, for which summaries are completed, and for which summaries are in preparation are listed in tabular form. This is the last such report to be issued by ICAO, as it is now th responsibility of WMO to publish such information. *Subject Headings:* **1. Aeronautica meteorological summaries 2. ICAO standard atmosphere.**—*M.R.*

9.5–67 551.5:797.55(06

International Scientific Gliding Organization, 7th Congress, St. Yan, France, July 1956 **Abstracts of [papers of] the Meteorological Section.** *American Meteorological Society Bulletin*, 37(7):374–376, Sept. **1956. DWB**—Abstracts of twenty-three papers presente at the Meteorological section of the OSTIV Congress at St. Yan on July 6–13, 1956, under th chairmanship of JOACHIM KUETTNER of USAF-G.R.D., and others. Subjects covered include the Jet Stream, squall lines, thermals, atmospheric waves, etc. Papers were given by WALTE GEORGII, PAUL RAETHJEN, MORRIS TEPPER, MYRON LIGDA, M. CADĚZ, R. SCORER, H. KOSCH MIEDER, PAUL MACCREADY and others. *Subject Headings:* **1. Gliding congresses 2. Glidin meteorology 3. St. Yan, France.**—*M.R.*

9.5–68 551.501:551.55

Vaccaro, Martha W., **An evaluation of the airplane response method for determinin vertical gust velocities.** Woods Hole Oceanographic Institution, Contract Nonr-1721(00 (NR-082-021), Technical Report, No. 38, Nov. **1955.** 5 p. 5 figs., table, 4 refs., eqs. **DW** (M:551.46 W894mt No. 38)—BUNKER's (1955) method (*see* 7.3–81, March 1956, *MAB* for determining the vertical gust velocity in terms of the vertical acceleration of the airplane the change in airspeed and the pitch angle developed further by J. S. MALKUS and FINK (1955 and checked by E. E. LARRABEE (1955), are further tested statistically and found to be correc within 0.2% when the gust is at a maximum but much greater when the gust velocity passe through zero. Absolute values of error never exceed 5 cm/sec. Other methods of averagin (than using deviations of airspeed (Vt), and pitch angle (α_{att}) from total mean) give larg errors. It is concluded that airplane response method is satisfactory for determining vertica gust velocities if proper computation methods are used. *Subject Headings:* **1. Vertical gus velocity measurement 2. Turbulence observation 3. Airplane response method.**—*M.R.*

AGRICULTURAL METEOROLOGY

See also: **Soil temp. and plant growth** (Joint Committee on Soil Tilth), 9.5–4; **Conf. on irrigation**, 9.5–39; **Soil temp. effect on fertilizers** (Dubovik), 9.5–182; **Agric. microclimat.** (Frenyo), 9.5–246; **Agroclimat. regionalization, U.S.S.R.** (Sapozhnikova), 9.5–251.

9.5–69 551.5:6

Hildreth, R. J.; Fisher, Flake L. and Caldwell, A. G., **Influence of rainfall on profits fro fertilizer applications to East Texas forage.** *Texas. Agricultural Experimental Station College Station, Miscellaneous Publication*, No. 184, Oct. **1956.** 6 p. 3 figs., 4 tables. **DW** (M:63 T355i)—Using available rainfall records, the profit to be expected from the use c fertilizer is given for 25 places in East Texas. Graphs show relation between rainfall an forage yield for fertilized and unfertilized plots. Tables give odds and percent of years tha an annual fertilizing rate of 60-30-30 will be profitable if forage price is $15, $20 or $25 a to In the various places an added inch of spring and summer rain increases forage yields o unfertilized land 110 lbs and on fertilized land 220 lbs. Fertilized plots used rainfall mor efficiently in low rainfall years than in high. March–Sept. rainfall showed a closer correlatio with yield than did Feb.–Sept. or Jan.–Sept. rain. *Subject Headings:* **1. Rainfall effects o fertilizer efficiency 2. Agricultural meteorology 3. East Texas.**—*M.R.*

9.5–70 551.58:63(675

Institut National pour l'Etude Agronomique du Congo Belge, **Au service de l'agricultur Congolaise: son but, son programme, ses réalisations.** [In the service of Congo agriculture

its purpose, its program, its accomplishments.] 3d ed. June **1956.** 114 p. 4 charts (2 fold.). Publication of the INEAC, p. 103–114. Also: 4th ed. Oct. **1957.** 155 p. 54 figs., 4 charts (1 fold.). Publication of the INEAC, p. 141–153. **DA**—1956 edition describes and illustrates the work and facilities at Yangambi for agronomical research, the work of the Division of Climatology of INEAC under direction of ÉTIENNE BERNARD is outlined briefly on p. 24–5, and the personnel listed on p. 85. There are: 1 central station (Yangambi), 5 principal stations, 11 first order, 12 second order and 28 third order stations in the agrometeorological network. One of the ecoclimatological stations (at Mulangu) is shown opposite p. 47. (For 1954 ed., *see* 6.3–286, March 1955, *MAB.*) *Subject Headings:* **1. Agrometeorological networks 2. Yangambi, Belgian Congo.**—*M.R.*

9.5–71 631.67:631.4:551.45(569.4)

Kedar, Yehuda, **Water and soil from the desert: some ancient agricultural achievements in the Central Negev.** *Geographical Journal,* 123(2):179–187, June **1957.** fig., 4 photos., 12 refs. **DWB**—Negev region was fairly densely inhabited in 2nd to 7th Centuries A.D. Climate is arid (rainfall erratic and <100 mm/yr) and region is now almost uninhabited. Rainfall was formerly collected by canals; canals and dams were also built to supply soil. Calculations show that climate was similar to to-day. *Subject Headings:* **1. Irrigation canals 2. Soil conservation 3. Deserts 4. Negev, Israel.**—*C.E.P.B.*

9.5–72 551.586:633.2(83)

Klapp, Ernst, **Futterbau und Futterwirtschaft in Chile zwischen dem 30. und 42.° s. Br.** [Cultivation and economy of forage crops in Chile between 30 and 40°S latitude.] *Bonner Geographische Abhandlungen,* Bonn, No. 17:87–137, **1956.** tables, 28 refs. Spanish summary, p. 187–188. **DLC**—A general description of the climate of Chile is given and the effect upon vegetation. This is followed by a more detailed study of the relationship of climate to fodder crop production in the subtropical dwarf shrub steppe and of the cactus steppe of the "Small North." Climatic descriptions are given of the following regions: the hinterland of Coquimbo-LaSerena, Aconague to Rio Mante, the transition zone of the Laja heath, and Frontera Osorno-Llanquihue, and the Cordillera piedmont. *Subject Headings:* **1. Agricultural climatology 2. Forage crops 3. Climate of Chile 4. Chile.**—*I.L.D.*

9.5–73 551.586:63

†Landsberg, Helmut E. (*Dir., Off. of Clim., U. S. W. B.*), **Agroclimatic research.** Paper prepared for presentation to Experiment Station Section. Meetings of American Association of Land-Grant Colleges and Universities, Washington, Nov. 13, **1956.** 10 p. 39 refs. **DWB**—A general discussion of the relation of climate and climatic services to agriculture and agricultural research is followed by a discussion of data processing problems and mention of specific examples of applications or possible applications of data to particular problems. General means, degree days or drought criteria, for example, have proven of little value, as each crop demands separate treatment of separate criteria to obtain significant results. A good bibliography is appended. *Subject Headings:* **1. Agroclimatological research 2. Climate and crops.**—*M.R.*

9.5–74 551.586:633:631.67

*Myers, Victor I.; Corey, G. L. and LeBaron, Marshall, **Irrigation of field beans in Idaho. 1956?** 19 p. 2 foot-refs., 12 tables. **DWB**—Temperature (air and soil), precipitation and evaporation data obtained at the Twin Falls, Idaho experiment station (3770 ft elevation) for May–Sept. 1952–54, were used in a study of irrigation practices for field beans. Best practices recommended are tied in with soil moisture which in turn is related to soil temperature. Correlations between various parameters showed little relation between soil temperatures at various depths. Irrigation according to need gave far better results than irrigation according to calendar. *Subject Headings:* **1. Agrometeorological studies 2. Irrigation-weather relationships.**—*M.R.*

FOREST METEOROLOGY

See also: **Shelter belt effects on wind erosion** (Egerszegi), 9.5–197; **Forest influences on water regime** (Rutovskaia), 9.5–260.

9.5–75 551.588:551.52

Landsberg, H. E., **Nature's air conditioner.** *American Forests*, Aug. **1956.** illus., photo **DLC**—Beginning with a general discussion of the change in climate produced by man in changing his environment, as illustrated in urbanization, the author then discusses the role of Rock Creek Park in Washington as a climatic balance. The temperature march on a hot summer day in Rock Creek Park is compared with that in downtown Washington. *Subject Headings:* **1. Environmental influences 2. Temperature comparisons 3. Rock Creek Park, Washington D. C.**—*I.L.D.*

9.5–76 551.584.31

Oosting, H. J. and Hess, D. W. (*both, Duke Univ., Durham, North Carolina*), **Microclimate and a relic stand of *Tsuga Canadensis* in the lower Piedmont of North Carolina.** *Ecology* Durham, N. C., 37(1):28–39, Jan. **1955.** 4 figs., 5 tables, 22 refs. **DWB, DLC**—A year's study is made of the relationship between microclimatic and edaphic conditions and seedling growth of a disjunct stand of *Tsuga Canadensis*, situated on a north-facing bluff in the lower Piedmont of North Carolina. Measurements of temperature were made from 38 cm below the soil surface to 15 cm above the soil; a recording hydrothermograph was placed at the 15 cm level, and humidity was measured also at 5 cm with a wet-bulb psychrometer, evaporation was studied by Livingston atmometer; light intensity was measured with photoelectric cells and soil moisture was determined with Colman fiberglass soil moisture units. The results, presented graphically, indicate that on the bluff face, soil temperature insolation, and evaporation are lower and available soil moisture is greater than on the bluff top where hemlock is absent. Slight differences in several factors are significant in the survival of *Tsuga* seedlings. *Subject Headings:* **1. Microclimatic data 2. Slope microclimatology.**—*I.L.D.*

INDUSTRIAL METEOROLOGY

See also: **Industrial thermometry** (Hoge), 9.5–112; **Temp. charts and merchandising, U. S.,** 9.5–175; **Wind power utilization** (Ladacs-Kiss), 9.5–198.

9.5–77 620.9:551.521.1

Tabor, Harry, **Progress in solar power.** *Scientific American*, N. Y., 195(1):97–106, July **1956.** 2 photos. **DWB, DLC**—Various types of solar energy collectors are described and some of them illustrated. Efficiency is very low for high temperature collectors but conversion efficiency is low for low temperature collectors. Solar heating of houses would be practicable where power is expensive and solar engines might be practicable if efficiency could be raised or production cheapened. Chemical and photosynthetic methods are mentioned. Salt-fresh water in layers is used in the Dead Sea area, as the heated salt water stays at the bottom and the cooler fresh water floats on top and insulates the hotter bottom water so that it does not lose its heat by radiation. *Subject Heading:* **1. Solar energy utilization.**—*M.R.*

9.5–78 551.556.1:624.21

Teddington, England. National Physical Laboratory, **Wind effects on bridges and other flexible structures.** Its *Notes on Applied Science*, No. 11, **1955.** 14 p. 3 figs., 5 photos., 8 refs., 2 eqs. **DWB** (M56.1)—Model studies made at the National Physical Laboratory (in wind tunnels) in order to prevent the annoying or destructive forces of buffeting, aerodynamic instability, or static instability, are described and illustrated. The Tacoma Narrows Bridge in Washington State is the classic example of a suspension bridge collapse due to aerodynamic instability (full page illustration). Since its collapse in 1940, many studies have been made in laboratories (Univ. of Washington and elsewhere). Work at Teddington began in 1946 on aerodynamic stability of suspension bridges (for proposed Severn and Mersey bridges)

methods of experimentation and results are outlined. *Subject Headings:* **1. Wind effects on bridges 2. Aerodynamic instability of bridges 3. Buffeting of bridges 4. Tacoma, Wash.** —*M.R.*

9.5–79 551.510.42:6 551.556.4:551.510.42

Topitz, A. (*Vienna*), **Zur Bedeutung der Windverhältnisse für die Raumplanung.** [The importance of wind conditions to space planning.] *Wetter und Leben*, Vienna, 8(8/11):206–213, **1956.** 4 tables, 9 refs. **DLC**—The importance of considering meteorological conditions, particularly winds, on planning industrial districts so as to provide suitable ventilation and removal of air pollutants is stressed. The special conditions of wind, distribution and velocity, and the siting of industrial and residential districts in Vienna, Innsbruck, Salzburg and Linz are discussed with the aid of numerical data on wind structure. *Subject Headings:* **1. Industrial site planning 2. Wind effects on atmospheric pollution.**—*I.L.D.*

MEDICAL METEOROLOGY

See also: **Tin content of the atmos.** (Paul et al.), 9.5–129; **Mercury in the atmos.** (Polezhaev), 9.5–130.

9.5–80 551.5:612.8

†Kérdő, István, **Időjárás és vegetatív idegrendszer.** [Weather and the vegetative nervous system.] *Időjárás*, Budapest, 55(5/6):136–144, May/June **1951.** table, 28 refs. **DLC**—World literature on the effects of various weather factors on functions of the human body is reviewed. It is stated that the vegetative nervous system is involved in all weather effects on body functions or diseases, including epidemic diseases. *Subject Headings:* **1. Physiological meteorology 2. Vegetative nervous system.**—*G.T.*

9.5–81 551.586:616.2:615.83

Kérdő, István, **Néhány szempont az egyes gyógyklímák indikációjának és kontraindikációjának kérdéséhez, különös tekintettel a tuberculosisos betegek kezelésére.** [Usefulness or harmfulness of various resort climates with particular reference to tuberculous patients.] *Időjárás*, Budapest, 55(9/10):285–287, Sept./Oct. **1951.** 7 refs. Russian and German summaries p. 311–312. **DLC**—For a correct application of climatotherapy, three groups of factors have to be considered: 1) climatic elements, 2) types and form of the disease and 3) constitution of the patient. Among the climatic factors, stability of weather is one of the most important for tuberculous patients. *Subject Headings:* **1. Health resorts 2. Weather effects on respiratory diseases 3. Tuberculosis.**—*G.T.*

9.5–82 551.586:616.891

Khazen, I. N. and Kuznets, E. I. (*Central Postgraduate Medical Inst.*), **Vliianie bol'shikh perepadov barometricheskogo davleniia v mikrointervale vremeni na vysshuiu nervnuiu deiatel'nost' belykh krys.** [The effect of large drops in barometric pressure in microintervals of time on the higher nervous activity of white rats.] *Akademiia Nauk SSSR, Doklady*, 108(5): 985–987, June 11, **1956.** table, 2 refs. **DLC**—White mice were subjected under laboratory conditions to barometric pressure drops from 760 to 90 mm Hg over a period of 0.008 second. The return to normal pressure occurred after 60–90 second, and to 465 mm Hg after 9–12 seconds, and the conditioned reflexes were examined. Also, the rats were subjected at first to a pressure of 310–465 mm Hg and a sudden drop to 90 mm Hg after an interval of 18–20 days. The rats manifested extreme distress, difficult breathing, etc., and some died. Some adaptation is achieved by exposure to low pressure. *Subject Heading:* **1. Pressure effects on nervous reactions.**—*I.L.D.*

9.5–83 551.586:69:612

Lee, Douglas H. K. (*Prof. Physiological Clim., Johns Hopkins Univ., Baltimore, Md.*), **Physiological objectives in hot weather housing.** Wash., D. C., U. S. Housing and Home Finance Agency, June **1953.** 79 p. 15 figs., numerous photos., 19 tables, 23 refs. **DWB**—The author presents the principles of housing design for warm climates, taking into considera-

tion the physiological reactions of human beings to high environmental temperature and humidity. The discussion includes the following: human heat balance, heat tolerance levels and effects of heat stress; fundamental climatology of the tropical and subtropical regions including the characteristics of air temperature, vapor pressure, air movement, solar radiation and a discussion of climatic types; housing design to provide protection against hot dry and warm humid climates; and for climates where hot, dry and warm humid conditions alternate with cooler conditions; and functional considerations in designing houses for warm climates. The appendix contains a description of the heliodon and its use, of the psychrometric chart and tables of incidence of solar radiation. The monograph contains numerous diagrams, photographs and climatic data. *Subject Headings:* **1. Hot climates 2. Building design 3. Physiological climatology. I. U. S. Institute of Inter-American Affairs.**—*I.L.D.*

9.5–84 551.510.41 :546.13

Takhirov, M. T., **Materialy k obosnovaniiu predel'no dopustimoĭ kontsentratsii khlora v atmosfernom vozdukhe.** [Determination of maximum allowable concentration of chlorine in the atmosphere.] *Gigiena i Sanitariia*, Moscow, 22(1):13–18, Jan. **1957.** 2 figs., table, refs. **DLC**—Analyses of air in the vicinity of a chemical plant, and at a considerable distance in the residential areas, have shown that the atmosphere of large cities contains free chlorine even at a distance from the sources of its discharge. The threshold for the sensation of smell of chlorine by sensitive persons is 0.8 mg/m³. The threshold of reflex action of chlorine on sensation of light coincides with the threshold of sensation of smell. The threshold of reflex action of chlorine on the rhythm and amplitude of breathing and the optical chronaxy is 1.5 mg/m³. The maximum allowable concentration of chlorine at one time in the atmosphere (0.1 mg/m³) is below the threshold of sensation of smell of chlorine and its reflex action through the receptors of the upper respiratory tract and therefore does not require any further diminution. *Subject Headings:* **1. Chlorine content of air 2. Air sampling and analysis.**—*I.L.D.*

METEOROLOGICAL OBSERVATIONS AND INSTRUMENTS

METHODS OF OBSERVATION

See also: **Linkes Met. Taschenbuch,** 9.5–6; **Vietnam met. networks,** 9.5–33; **Cooperative observers** (Hagarty), 9.5–34; **Aerological diagrams** (Sorodoc), 9.5–102; **Humidity measurement** (Demidov, Mokhov), 9.5–202; **Evapotranspiration nomograms** (Palmer, Havens), 9.5–206.

9.5–85 551.501 :551.524 551.501 :551.571

*†Bespalov, D. P., **Tochnost' izmereniĭ temperatury i vlazhnosti vozdukha i perspektivy ee povysheniia.** [Accuracy of air temperature and humidity measurements and prospects for improvement.] *Leningrad. Glavnaia Geofizicheskaia Observatoriia, Trudy*, 61(123):3–21, **1956.** 6 figs., 26 refs., 17 eqs. **DWB**—The accuracy of temperature and humidity measurements, as carried out by the network of hydrometeorological stations of the USSR, is analyzed. Prospects and measures for improving them are discussed. Curves show the relative accuracy of temperature and humidity measurements under various conditions. Wind is also considered. *Subject Headings:* **1. Temperature measurement improvement 2. Humidity measurement improvement 3. U.S.S.R.**—*A.M.P.*

9.5–86 551.501 :551.521.1

*Drummond, A. J., **Measurement of solar radiation in the continent of Africa.** Pretoria, South Africa Weather Bureau, Oct. 19, **1955.** 14 p. Mimeog. **DWB** (M21.1 S726m)—A full account of the comprehensive solar radiation program inaugurated in Africa during the 1953–55 period and involving 36 stations in 1956 and an estimated 50 by July 1957 is presented. Two continental centers (Pretoria and Leopoldville) have been formed for standardization of observations and instruments and publication of data. Conferences held in Africa network, observatories visited throughout world in 1953 and 1954, a description of Central Radiation Observatory (Pretoria) and its program, instruments, calibrations, equipment,

nd S. Africa network (and proposed extension during IGY), instrument development, processing and publishing of data, research program and staff at Pretoria are outlined. *Subject Headings:* **1. Radiation networks 2. Solar radiation research 3. Africa 4. S. Africa. I. South Africa. Weather Bureau.**—*M.R.*

9.5–87 551.501.4:551.557(261)

*O'Byrne, J. W. and Connaughton, M. J., **An analysis of the wind components at the 300 MB level along the Great Circle track between Shannon and Gander.** *Eire. Meteorological Service, Technical Note*, No. 24, May **1957.** 11 p. 5 figs., 3 tables, 8 refs. **DWB**—The mean wind components at the 300 mb level along the Great Circle track between Shannon and Gander at 0300 and 1500 GMT each day over the period May, 1950 to April, 1956, inclusive, were obtained from charts for this level. The mean value and standard deviation of the wind components are given for all months and years. The frequency distributions of the components and of the twelve-hour component changes are given for all months of the year. Correlation between the components at the 300 and 500 mb levels is found to be high and linear regression equations computed for the different months give the 300 mb components from the 500 mb components to a high degree of accuracy. *Subject Headings:* **1. Wind components 2. North Atlantic.**—*Authors' abstract.*

9.5–88 551.501.45:551.557

Chiu, Wan-cheng, **The observed mean monthly wind fields in the lower stratosphere and upper troposphere over North America.** *Journal of Meteorology*, 15(1):9–16, Feb. **1958.** 15 figs., table, 11 refs., eqs. **DWB, DLC.** Also issued as: N. Y. Univ. College of Engineering. Research Div. Dept. of Meteorology and Oceanography, Contract AF 19(604)-1755, Scientific Report, No. 1, April **1957.** 19 p. 23 figs., 15 refs., eq.—The mean monthly wind fields at five different levels from the 300 mb surface to the 30 mb surface were constructed from rawinsonde data taken by stations in North America and adjacent waters over the four year period, from 1951 to 1954. These wind fields are represented by streamlines and isotachs on isobaric maps. The general features of these wind fields at four midseason months, as revealed by these maps, are discussed. The detailed features of these fields, such as the variation of the mean wind components with latitude, longitude or time, are scrutinized and made obvious by diagrams. *Subject Headings:* **1. Wind field analysis 2. Monthly mean wind fields 3. North America.**—*Author's abstract.*

9.5–89 551.501.45:551.552

Iudin, M. I., **Predvychislenie polia vetra i sviazannykh s nim meteorologicheskikh elementov.** [Precomputation of the wind field and its associated meteorological elements.] *Akademiia Nauk SSSR, Doklady*, 112(1):49–52, Jan./Feb. **1957.** 4 refs., 16 eqs. **DWB, DLC**—In calculating the wind field it is necessary to determine the deviation of the actual wind from the geostrophic wind, particularly in the upper troposphere. A direct method for calculating this deviation is described. Equations are presented for calculating the deviation of the wind from the geostrophic U′V′ along the axes x and y, variation of the geostrophic wind with temperature and time, the velocity of moving given points in a geopotential field, and numerical forecasting of geostrophic and actual wind, vertical velocities and atmospheric temperature. *Subject Headings:* **1. Wind field computation 2. Wind deviation 3. Geostrophic winds 4. Wind forecasting.**—*I.L.D.*

9.5–90 551.501.6:551.524.31

Dobrilović, B., **O mogućnosti tačnije obrade termograma.** [A method of accurate thermogram analysis.] *Yugoslavia. Hidrometeorološka Služba, Vesnik*, 5(3/4):105–110, July/Dec. **1956.** 3 figs., table. **DWB**—Determination of the exact time of occurrence of minimum temperature is an important factor in the analysis of diurnal temperature variations. On thermograph records (mainly because of instrumental lag) this time may not be obtained without correction. A basis for such correction is provided by graphical interpolation between correction for 9 p.m. and 7 a.m. of the following day (as minimum temperature usually occurs between these two times of measurement). The method is explained in detail and shown in examples. *Subject Headings:* **1. Thermogram analysis 2. Minimum temperature 3. Diurnal temperature variations.**—*G.T.*

9.5–91 551.501.7:551.507.

§Rutherford, G. T. and Hannan, F. T. (*both, Bureau of Met., Australia*), **Aircraft weat reconnaissance in Australian waters.** (In: Tropical Cyclone Symposium, Brisbane, D 1956, **Proceedings.** Pub. Dec. **1956.** p. 379–390. 7 figs., table, 3 refs.) **DWB**—An asse ment is made of the value of a daily weather reconnaissance, which was carried out over Timor Sea area between March and June, 1956. This is done by classification of the M.S synoptic situations in this area into models broadly favorable and unfavorable for cycl development, according to criteria available from the routine ground observation netwo From examination of the reconnaissance reports, in conjunction with relevant M.S.L. synop charts, it is concluded that, for the period under review, those suspicious situations (wh aerial reconnaissance is necessary to decide the presence of a disturbance) can in most ca adequately be predetermined from the surface chart analysis. Reference is made to sc restricted forms of aerial reconnaissance, and a possible program, necessarily limited marginal utility considerations, outlined for the Australian region. *Subject Headings:* **1. A craft weather reconnaissance 2. Synoptic charts 3. Australian region.**—*Authors' abstract*

9.5–92 551.501.7:551.

Showalter, A. K. (*Natl. Weather Analysis Center, U. S. W. B., Suitland, Md.*), **A simp technique for measuring radius of curvature of streamlines.** *American Meteorological Soci Bulletin*, 37(7):368–369, Sept. **1956.** 2 figs., table, ref. **DWB**—A geometrical meth making use of the fact that the radius of curvature of an arc is the chart subtending 60° of a is demonstrated for determining the radius of curvature of streamlines (or isobars if strea lines are not available). If isogons of wind direction are marked off for every 30° the proc is simple. For anticyclonic curvature there is a critical minimum curvature which is termined for each 5° lat. from 15° to 90° by use of a table of coefficients of geostrophic w for this minimum curvature. In mid latitude, the minimum radius of anticyclonic curvat in nautical miles is about 10 times the geostrophic wind in knots. *Subject Headings:* **1. Strea line analysis techniques 2. Geostrophic wind scales 3. Radius of curvature of streamlin** —*M.R.*

9.5–93 551.501.8:551.51

Brann, H. N.; Hennessy, J. and Ryan, P. (*all, Bureau of Met., Australia*), **Radar observ tions of a tropical cyclone at Townsville, Queensland.** (In: Tropical Cyclone Symposiu Brisbane, Dec. 1956, **Proceedings.** Pub. Dec. **1956.** p. 199–204, 4 figs., 3 refs.) **DWB** In the 1955–6 cyclone season, one tropical cyclone, the first to be observed by an Austral radar installation, came within range of the storm warning radar at Townsville during Ma 5–6, 1956. Observations were made of the precipitation patterns at intervals for some hours before the cyclone reached Townsville. There was some evidence of squall conditi and bands were observed near the centre; precipitation echoes reached a height of appro mately 28,000 ft in this region. The movement of the center was plotted for several hou allowing adequate local warnings of its approach to be given. The observations indicated th the structure of the precipitation patterns for this cyclone was similar to that described in U. S. for hurricanes. *Subject Headings:* **1. Radar observation of tropical cyclones 2. Rad precipitation echoes 3. Townsville, Queensland.**—*Authors' abstract.*

OBSERVATIONAL DATA

See also: **Met. data, Weddell Sea** (Capurro), 9.5–30; **Met. data, Port Martin** (Le Quinio), 9.5–32; **Aerobee soundings** (Pressly, Townsend), 9.5–103.

9.5–94 551.506.1:551.577(9

*Bryson, Reid A., **Fourier analysis of the annual march of precipitation in Austral** *Arizona. Univ. Institute of Atmospheric Physics, Technical Reports on the Meteorology a Climatology of Arid Regions*, No. 5, May 31, **1957.** 6 p. 8 figs., table, 7 refs. **DWB** Monthly standard normal rainfall data for about 200 Australian stations was subjected Fourier analysis. Charts were then plotted for phase angle and amplitude of each of the fi four harmonics. These provide an objective description of the pattern of annual march

ainfall, and clearly delineate certain rainfall regions and climatic divides. *Subject Headings:* **. Monthly rainfall data 2. Annual march of precipitation 3. Fourier analysis 4. Australia.** *–Author's abstract.*

9.5–95 551.506.1(71) 551.589.5:656.71

*Canada. Meteorological Division, **General summaries of hourly weather observations n Canada, 1954.** [pub. **1956.**] 2 vols., almost entirely tables. **DWB** (M06.1/71). Vol. 1 306 p.), **British Columbia, Yukon Territory, Alberta, Saskatchewan, Manitoba.** Vol. 2 298 p.) **Ontario, Quebec, Atlantic Provinces, Northwest Territories, Newfoundland.** Also 955, Vol. 1, (pub. **1957?**) 320 p. **DWB**—These two large volumes contain tabulations of requencies of cloud amounts, types, precip.; ceiling and visibility; and ceiling, visibility and ind; and weather types at about 150 hourly reporting stations distributed throughout the 10 rovinces and territories of Canada named above. Each summary comprises 4 pages of nonthly and annual frequencies, etc. Most of the stations are at airports. *Subject Headings:* **. Airport meteorological data 2. Ceiling-visibility-wind frequencies 3. Observational data . Canada.**—*M.R.*

9.5–96 551.506.1:551.577.21(45)

*Italy. Ufficio Idrografico, Genova, **Annali idrologici,** [Hydrological annals], **1953, Pt. 1.** ssued Rome, **1956.** 75 p. almost entirely tables. **DWB** (M06.1/45 I88ag 1953, Pt. 1). lso: **Pt. 2,** issued **1956.** 75 p.—A standard hydrological yearbook in Pt. 1, giving extensive ables of daily mean, maximum and minimum temp., precip., plus snow depths, extreme rain- alls, rainfall on consecutive days for about 125 stations in the region bordering the Gulf of enoa. A colored isohyetal chart for the year (on a large colored topographic map) is inserted. t. 2 contains hydrological data plus an analysis (p. 47–56) of the flash floods of Sept. 18–20 nd Oct. 15, 1953 in the Bisagno and the Entella basins (up to 330 mm and 200 mm), respec- ively. *Subject Headings:* **1. Hydrologic yearbooks 2. Annual precipitation bulletins . Floods, Italy (1953) 4. Genoa region, Italy.**—*M.R.*

9.5–97 551.506.1:551.582.2(52)

*Japan. Meteorological Agency, Tokyo, **Average daily values of twelve meteorological lements.** Pub. Tokyo, July **1957.** 279 p. Almost entirely tables. In Japanese and nglish.—Averages of 1) daily mean station pressure, 2) sea level pressure, 3) temperature,) maximum temperature, 5) minimum temperature, 6) vapor pressure, 7) relative humidity,) cloud amount, 9) wind speed, 10) precip., 11) sunshine duration, 12) maximum snow depth. he averages are for entire period of record up to 1950. Data for 139 stations are included. abulations are made by machine and arranged by stations (2 pages to a station) and by nonths (6 blocks of months per page). *Subject Headings:* **1. Climatic data for Japan 2. Daily verage meteorological data 3. Japan.**—*M.R.*

9.5–98 551.506.1:551.506.7(97)

*Mauritius. [Royal Alfred Observatory], **Meteorological observations and climatological ummaries, vol. 1, 1951**—Latest issue seen June 1954, pub. Aug. **1955.** about 12 p. each. Monthly. This series is a continuation of their series **Meteorological Results, 1888–1913//** nd of their **Results of Magnetical and Meteorological Observations, 1915–1950//.**—Monthly ata compilations are published for Agalega, Diego Garcia; Pamplemousses, Plaisance, Vacoas; Rodrigues and St. Brandon, in the Mauritius group of islands. Sites are described for each tation, and peculiarities of data recorded (wind, cloud, rainfall, pressure, temp., weather, apor pressure). Wind, pressure, temp., relative humidity, visibility, cloud and gales are ummarized for 00, 03, 06, 09, 12, 15 and 18 h, wherever available. Soil temp. is given for , 2, 5 and 10 ft depth and evaporation for Pamplemousses. Sunshine hours, and upper winds o 50,000 ft are given for several stations and rainfall for >150 stations in the group. *Subject Headings:* **1. Monthly meteorological reports 2. Soil temperature data 3. Upper air wind ata 4. Mauritius. I. Davy, E. G.**—*M.R.*

9.5–99 551.506.1(679)

*Mozambique. Serviço Meteorológico, **Boletim Mensal das Observações Meteorológicas,** Monthly bulletin of meteorological observations], **Vol. 22, No. 7, July 1955.** pub. Lourenço-

Marques, **1956.** p. 356–413. entirely tables. Continuation of *Mozambique. Observator Campos Rodrigues, Lourenço-Marques, Boletim Mensal das Observações Meteorológicas feit nos Postos da Colonia.* **DWB, DLC**—Recent issues of this excellent monthly bulletin (s 3.7–49, July 1952, *MAB for 1934–1950 issues*) contain daily and monthly pressure, ter perature (shelter, surface, 0.5 and 3.0 m depth), vapor pressure, relative humidity, evaporatio precip., sunshine, wind (9, 15 and 21 h), clouds (9, 15 and 21), visibility, etc. for Lourenç Marques, Inhambane, Beira, Quelimane, Tete, Mossuril, Vila Cabral, Porto Amelia and le extensive monthly data for 40 1st and 2nd order stations and over 100 climatological statio Radiosonde data (surface, 1,000, 900, 850, 800, 700, 600, 500, 400, 300, 250, 200, 175, 15 125, 100 mb and significant levels, tropopause and 0°C isotherm), means and extremes for ea level at Lourenço-Marques and pibal data for 03 and 09 h for 8 stations listed above a presented. *Subject Headings:* **1. Monthly data bulletins 2. Observational data 3. Upp air data 4. Upper air wind data 5. Tropopause data 6. Mozambique 7. Lourenço-Ma ques.**—*M.R.*

9.5–100 551.506.1 (66

*Portuguese Guinea. Serviço Meteorológico, **Elementos climatológicos,** [Climatologic elements], **Jan.–June 1957.** 6 pieces. almost entirely tables. **DWB**—Standard tables daily (3 synoptic hours) data for 8 stations in Portuguese Guinea. State of ground, sun ter perature, visibility and sunshine data are included for 3 stations, and evaporation and clou ness data for all 8. In addition, daily precipitation data are included for 14 stations a monthly precipitation totals and frequencies for all 22. Winds aloft at 0900 for Bissau a port are given for surface, 600, 900, 1200, 1500, 1800, 2100, 3000, 3900, 5100, 5400, 6000, 72 and 9000 m. An isohyetal chart for the month (50 mm intervals) is also included. *Subj Headings:* **1. Monthly summaries 2. Observational data 3. Portuguese Guinea.**—*M.R.*

INSTRUMENT CARRIERS

See also: **Rocket and satellite research** (Fedorov, Shuridin), 9.5–54; **Aircraft weather reconnaissance, Australia** (Rutherford, Hannan), 9.5–91.

9.5–101 551.507.321

Pierce, Henry White, **Toy shelf to stratosphere.** *Science News Letter*, Wash., D. C 69(15):234–235, April 14, **1956.** photo. **DGC, DLC.** Also, **Improve balloon for recordi weather.** *Ibid.*, 69(8):117, Feb. 25, **1956.** Photo (front cover). **DWB, DLC**—Launchi of a giant meteorological (sky-hook) balloon from an air base at Vernalis, Calif. is shown in illustration accompanying a popular-scientific article on various types of balloons, the performance and uses. The launching of rockets and possibly satellites from balloons 75,000 to 120,000 ft, use for primary cosmic ray measurements at such high altitudes, cost polyethylene fabric compared with rubber (4¢/sq yd: $2.00/sq yd), use in reconnaissance, et are described, showing balloon being filled with hydrogen through a 90 ft long sleeve. *Subj Heading:* **1. Sky-hook balloons.**—*M.R.*

9.5–102 551.501.7:551.507.352:551.508.

Sorodoc, C., **Cercetarea atmosferei cu avionul.** [Atmospheric research by airplane *Aripile Patriei*, Bucharest, 2(8):27, Aug. **1956. DLC**—Aerological research by means of meteorograph (recording temperature, humidity and pressure) mounted on an airplane, a subsequent analysis by means of aerological diagrams, is explained in general terms. T usefulness of aerological diagrams in identifying inversion layers, frontal surfaces and oth upper-air phenomena is discussed. *Subject Headings:* **1. Airplane meteorographs 2. Aer logical diagrams.**—*G.T.*

9.5–103 551.506.7:551.507.362

Pressly, E. C. and Townsend, J. W., Jr., **Aerobee-hi Report No. 4, the NRL-39, NRL-4 NRL-46, and NRL-50 firings.** *U. S. Naval Research Laboratory, NRL Report*, No. 489 *Upper Atmosphere Research Report*, No. 27, March 12, **1957.** 31 p. 21 figs., 6 tables, 6 re **DWB** (M11.U58u)—Specifications, instrument launching, flight performance and trajecto

data obtained during 4 NRL-Aerobee-hi firings in May and June 1956 are given in detail. NRL-39 failed completely; NRL-42 reached 117 mi but failed to reach predicted 190 mi due to thrust chamber failure; NRL-46 reached only 36 mi for the same reason, and NRL-50 reached 164 mi—a new record for boosted rockets built in America. The last firing gave ionospheric data. The next four firings will be at Fort Churchill during Oct.–Nov. 1956. *Subject Headings:* **1. Rocket soundings 2. Aerobee observations.**—*M.R.*

9.5–104 551.507.362.1

To send small rocket up about 60 miles. *Science News Letter*, Wash., D. C., 69(1):3–4, Jan. 7, **1956. DWB, DGL**—Explorations of the upper atmosphere and the fringe of outer space is planned at Woomera rocket range in Australia. It will be different from the U. S. space satellite program inasmuch as it will be a small rocket getting to height of about 60 mi. A small instrument-crammed rocket powered by solid fuel, instead of liquid, may be sent to about 70,000 ft attached to a large balloon and then fired by radio. It should reach a height of 300,000 ft, according to BROWN, controller of the Weapons Research Organization in Australia. *Subject Headings:* **1. Rocket development 2. Australia.**—*A.M.P.*

INSTRUMENTS

See also: **Airplane meteorographs** (Sorodoc), 9.5–102; **Apparatus for measuring elec. of precip.** (Kolokolov, Ogorodnov), 9.5–277; **Auroral instruments,** 9.5–279.

9.5–105 551.508.21

Borrel, Francis (*Obs. Mét. de Magny-les-Hameaux*), **Sur un nouveau mode d'utilisation du pyranomètre totalisateur à distillation.** [New method of utilizing the integrating distillation pyranometer.] *Journal Scientifique de la Météorologie*, Paris, 8(28):373–382, Oct./Dec. **1955.** fig., table, 2 refs., eqs. French, English and Spanish summaries p. 373. **DWB**—A study of the errors and calibration of the new integrating distillation pyranometer (using tetrachlomethane instead of ethanol or water as in the classical or the Bellani pyranometer). Errors are said to be largely due to the heat capacity of the receiver as well as to ventilation and to precipitation. To eliminate these errors, a white and a black receiving surface are employed (with 2 identical instruments) and the results found are comparable with those from a Moll thermopile (<7% difference in daily and <1% in weekly averages). *Subject Headings:* **1. Integrating distillation pyranometers 2. Instrument calibration.**—*M.R.*

9.5–106 551.508.21:551.521:535.211

Eppley, Marion and Karoli, Alton R. (*both, Eppley Found. for Research, Inc., Newport, R. I.*), **Absolute radiometry based on a change in electrical resistance.** *Optical Society of America, Journal*, 47(8):748–755, Aug. **1957.** 5 figs. (incl. photos), table, 20 refs., 3 eqs. **DWB, DLC**—A blackbody and an electrical method of absolute radiometry employing direct current instruments for the measurement of current and resistance are described. The blackbody, designed for performance near 1000°C, is an electrically heated tubular furnace containing an oxidized steel chamber as the radiating source. The radiometer consists, essentially, of a coil of platinum wire wound spirally and bifilar-wise on a blackened, thin, silver disk from which it is electrically insulated but in good thermal contact. The change in resistance of the coil is a measure of the radiation absorbed by the coated disk. By heating the coil electrically, the energy required to produce this change is readily calculated; thus, the deviation of the radiant energy of the source from the corresponding computed perfect blackbody radiation can be determined. This method indicated that the radiant flux emitted by the above source is within 1% of that from such an ideal blackbody at a temperature between 800°C and 1100°C. Included is a description of the apparatus used in the assemblage, as well as of the procedure followed in obtaining data, with a discussion of the probable sources of error. *Subject Headings:* **1. Blackbody radiation 2. Absolute radiometry.**—*Authors' abstract.*

9.5–107 551.508.21:551.521.6

Ross, Iu. K. and Tooming, Kh. G., **Ob izmerenii radiatsionnykh potokov pri pomoshchi pirgeometra (effektivnogo piranometra) Ianishevskogo.** [Measurement of radiation fluxes

by means of the pyrgeometer (effective pyranometer) of Ianishevskiĭ.] *Leningrad. Glavna Geofizicheskaia Observatoriia, Trudy*, 61(123):92–102, **1956.** 4 figs., 3 tables, 14 refs., 7 e **DWB**—Some results of the comparison of pyrgeometric data with computation data, accordi to the Kovaleva radiation nomogram, and the Berliand-Berliand table for clear skies, a presented. An attempt is also made to explain the possible errors of the system—albedome for the determination of E_A and $E_{B\downarrow}$ based on data from the Tartu actinometric stati of the Institute of Physics and Astronomy of the Academy of Sciences of the Esthonian SS *Subject Headings:* **1. Radiation flux 2. Radiation measurement comparisons 3. Pyrgeomete 4. Kovaleva radiation nomograms.**—*A.M.P.*

9.5–108 551.508.3

Ward, W. H. (*Building Res. Station, Watford, Herts, Eng.*), **Two portable thermis radiometers.** *Journal of Scientific Instruments*, London, 34(8):317–321, Aug. **1957.** 5 fig 8 refs. **DLC**—The construction and calibration of two portable radiometers suitable micrometeorological studies, is described. One instrument measures the hemispherical sho wave radiation and the other measures directly the total radiative flux through a plane. A tachments to the latter instrument permit total hemispherical radiation and psychromet measurements to be made. Small dry batteries, a tiny motor, a simple Wheatstone's bric and thermistors are used. *Subject Heading:* **1. Radiometers.**—*Author's abstract.*

9.5–109 551.508.3

Weger, Nikolaus, **Prüfung des Kugelpyranometers nach Bellani.** [Examination of t spheric pyranometer according to Bellani.] *Germany. Deutscher Wetterdienst, Mitteilunge* 2(14):182–184, **1955.** 2 figs. **DWB**—With the aid of a diagram and photograph, the auth describes the construction and use of the Bellani spherical pyranometer which is particula suited to measure incoming and outgoing radiation in microclimatic studies. Examples of use are described briefly. *Subject Heading:* **1. Bellani pyranometer.**—*I.L.D.*

9.5–110 551.508.3

Hoinkes, H. (*Inst. für Met. and Geoph., Univ. Innsbruck, Austria*), **Über ein neues strument zur Messung der Strahlungsdurchlässigkeit von Gletschereis oder Schnee.** new instrument for measuring radiation transmissivity of glacier ice or snow.] *La Météorolog* Paris, Ser. 4, No. 45/46:335–337, Jan./June **1957.** 2 figs., ref. German, French and Engl summaries p. 335. **DWB**—An instrument for radiation measurements is described of wh spherical receptive surface integrates over the diffuse light coming from all directions. In present form it is suitable for measurements of radiation in diffusing isotherm media, such melting glacier ice or snow. *Subject Headings:* **1. Radiation instruments 2. Glacial radiati measurement.**—*Author's abstract.*

9.5–111 551.508.25:551.521.61:551.521

Pohl, Wolfgang, **Messungen des ultraroten Strahlungsstromes in der freien Atmosphä** [Measurements of the infrared radiation flux in the free atmosphere.] *Germany. Deutsc Wetterdienst, Berichte*, 4(22):30–31, **1956.** fig. **DWB, DLC**—The procedure for measur directly infrared radiation involves the construction of a radiation meter provided with th mistors, weighing 45 grams, and the half period for establishing normal conditions is about sec. The measurements were made with the radiosonde method. Radiation flux v determined by the following equation

$$S = \frac{D\alpha_\gamma + D\alpha_1}{D\alpha_\gamma - D\alpha_e} = q \cdot H.$$

An example of a radiosonde ascent and measurements obtained are presented. *Subj Headings:* **1. Radiation meters 2. Infrared radiation measurement 3. Infrared radiat flux.**—*I.L.D.*

9.5–112 551.508.26

Hoge, Harold J. (*Leeds and Northrup Co.*), **Temperature measurement in engineeri** *American Institute of Physics, Temperature, its measurement and control in science and indus*

Vol. 2 (Oct. 1954 Symposium), pub. **1955.** p. 287–325. 18 figs. (incl. photos), 24 refs. **DWB, DLC**—The various standard types of thermometers used in engineering and industry are listed and their chief characteristics (range of temp., accuracy, cost, etc.) tabulated. The major types are 1) liquid in glass, 2) vapor pressure, 3) Bimetal, 4) liquid filled, 5) gas filled, 6) thermocouple-millivoltmeter, 7) thermocouple-potentiometer, 8) resistance without and with null balancing, 9) radiation pyrometers, 10) optical pyrometer. Each type and many sub-types are described and their construction, accuracy and uses noted and the instruments, circuits, recorders or indicators illustrated. A list of books and articles on the various types of industrial thermometers is included. *Subject Headings:* **1. Industrial thermometry 2. Temperature measurement in engineering.**—*M.R.*

9.5–113 551.508.29:551.596.1

Pardue, D. R. and Hedrich, A. L. (*both, Diamond Ordnance Fuze Labs., Wash., D. C.*), **Absolute method for sound intensity measurement.** *Review of Scientific Instruments*, N. Y., 27(8):631–632, Aug. **1956.** 3 figs., 7 eqs. **DWB, DLC, DGL**—A thermometer has been constructed for measuring fast, small amplitude temperature variations. Its use as a microphone and sound intensity meter is considered and details of the theory, construction, and performance presented. The instrument is based on the principle that temperature fluctuations are related to sound speed and intensity. Instead of using ultrasonic pulses as BARRETT and SUOMI (*J. of Met.*, Dec. **1944**) did, continuous 400 Kc waves were used and time was measured for travel between two transducers. *Subject Headings:* **1. Acoustical thermometers 2. Sound intensity thermometers.**—*M.R.*

SYNOPTIC ANALYSIS AND FORECASTING

See also: **Oceanog. and hydrologic forecasting** (Belinskiĭ), 9.5–11; **Synoptic processes, Central Asia** (Bugaev et al.), 9.5–12; **Micromet. forecasting** (Halstead), 9.5–14; **Terminal forecasts** (U. S. A. W. S.), 9.5–16; **Contrail forecasting manuals** (U. S. A. W. S.), 9.5–17; **Vietnam met. networks,** 9.5–33; **Storm forecasting problems, Cape Hatteras, N. C.** (Grundy), 9.5–160; **700 mb height computation** (Gales), 9.5–188; **Forecasting northwesters** (Bose), 9.5–196.

9.5–114 551.509:519.2

Brier, Glenn W. (*U. S. Weather Bureau*), **Probability forecasts from time series data.** *American Meteorological Society, Bulletin*, 38(2):74–76, Feb. **1957.** 2 figs., 2 tables. **DWB, DLC.** Also his: **Effect of errors in estimating probabilities on the usefulness of probability forecasts,** p. 76–78. fig., 6 refs., 8 eqs.—In the first paper BRIER discusses and presents illustrative tables and curves to show how useful probability forecasts can be made if, instead of forecasting the probability of a specific event (temperature, say) at a specific time in the future, the forecast is couched in terms of the probable time that will elapse until a given event occurs. With several different initial assumptions (temp. 33°–36°, 37°–42°, ⩾43°F, and falling or rising) it is possible to specifically determine the number of days until a freeze (32°F or below) or a deep freeze (temperature 20°F or lower) occurs at Wash., D. C., in Jan. These curves show that under some of the conditions a very high probability exists of the event occurring in a short time, whereas with other conditions a very low probability occurs for a short time, or a high probability that it will not occur for a week or two. These forecasts for 5–12 days can be made with some degree of usefulness and a higher chance of success than in the case of straight "climatology" forecasts, which lump together *all* cases. In the second paper, BRIER tries to show how probability forecasts can be of economic value, even if not perfect—providing they beat climatology. *Subject Headings:* **1. Probability forecasts 2. Freezing probability forecasts 3. Washington, D. C.**—*M.R.*

9.5–115 551.509.31

Morskoĭ, G. I., **K postanovke zadachi o teoreticheskom analize sinopticheskikh protsessov.** [Statement of the problem of theoretical analysis of synoptic processes.] *Moscow. Tsentral'nyĭ Institut Prognozov, Trudy*, 46(73):3–39, **1956.** 4 figs., 7 tables, 37 refs., 142 eqs.

DLC—Analysis of nonperiodic pressure changes is beset by two difficulties, involving the sm magnitude of the changes relative to the mean pressure and the fact that the pressure chan at any level depends upon the column of air supported by that level. Especially importa in theoretical coordinations is the precision of the constituent equations for determining t changes in the atmospheric layer. The author presents the equations for determining pressu and temperature by proceeding from the hydrostatic equation and the equation of heat a vection, examines the isopycnic level in the atmosphere including climatic data, the interdiurr atmosphere density at high altitude, temperature conditions, and variations of pressure a analyzes the limiting condition of the equation of geostrophic advection, the dynamic var tions of pressure, entropy and variations of pressure. *Subject Heading:* **1. Synoptic analys** —*I.L.D.*

9.5–116 551.509.31:551.51

§Ramage, C. S. (*Royal Obs., Hong Kong*), **Review of methods of tropical synoptic analy (with particular reference to tropical cyclones).** (In: Tropical Cyclone Symposium, Brisba Dec. 1956, **Proceedings.** Pub. Dec. **1956.** p. 75–96. 16 figs., table, 21 refs.) **DWB** Synoptic analysis in the tropics was almost entirely isobaric until the late 1920's when N wegian air mass and frontal concepts were introduced. These largely fail to explain proces in the tropics, although useful during the cool season in continental regions. Modern metho of tropical analysis incorporate models—easterly waves, tropical cyclones, polar troughs, e (which can generally be traced from chart to chart), and emphasize the important results interaction between low and high level systems. In regions with scattered observatio isobaric and streamline analysis supplemented by time-sections use all available data a enable the models to be identified. These analytical methods should work reasonably well the Australian area. Indirect aerology backed by an extensive synoptic climatology might some degree compensate for lack of observations over the neighboring seas. Many examp are given. *Subject Headings:* **1. Synoptic analysis of tropical cyclones 2. Tropical analys** —*Author's abstract.*

9.5–117 551.509.312:551.5

*Chaplygina, A. S., **24-chasovye izmeneniia termobaricheskikh poleĭ v svobodnoĭ a mosfere.** [24-hour variations of the thermobaric fields in the free atmosphere.] *Akadem Nauk SSSR. Geofizicheskiĭ Institut, Trudy,* No. 33(160):60–105, **1956.** 14 figs., 24 tabl 9 refs., eqs. **DLC**—Results of a statistical investigation of changes of the thermobaric fie at the main isobaric surfaces, carried out on the basis of analyses of daily charts of ba topography of the Central Forecasting Institute (TSIP) for 1–10 Sept. 1950 and the mont of May 1951 and 1952 are presented. The purpose of the investigations was to define m accurately the relations between changes of geopotential and horizontal transfer of vortic and heat, as indicated by recent theory. Good agreement is found between results and theo *Subject Headings:* **1. Numerical forecasting 2. Vorticity advection 3. 24-hour temperat change forecasts 4. Baric topography changes.**—*A.M.P.*

9.5–118 551.509.312:551.515

§Franke, Martin, **Ein Entwicklungssatz als Mittel zur Prognose auf Grund der hyd thermodynamischen Gleichungen einer trockenen, reibungslosen, baroklinen, kompressibl Modellatmosphäre.** [Development theory as a means of forecasting based on hydro-therm dynamic equations assuming a dry, frictionless, baroclinic, compressible model atmospher *Geofisica Pura e Applicata,* Milan, 35:94–125, Sept./Dec. **1956.** 10 figs., 13 refs., 32 e English summary p. 94. **DLC**—It is shown theoretically that a combination of hydrodynam concepts (vorticity, pressure, Sutcliffe's theory) and of thermodynamic concepts (dynam lability, solenoids, baroclinic field, entropy) gives a closer approach to the development weather than a purely hydrodynamic method. The result is an equation based on a mo of dry, baroclinic, compressible atmosphere without friction. In practical application, summa charts of wind shear, vorticity and entropy provide a good method of forecasting, especia of cyclogenetic development. A close connection is found between 24-hour isallobars a regions of persistent rainfall associated with currents toward descending vorticity *and* descen ing entropy. *Subject Headings:* **1. Weather forecasting 2. Sutcliffe's development thee 3. Hydro-thermodynamic concepts.**—*Author's abstract.*

9.5–119 551.509.312

Gião, Antonio, **Analyse géostrophique des champs de pression et de température.** [Geostrophic analysis of pressure and temperature fields.] *Geofisica Pura e Applicata*, Milan, 35:73–93, Sept./Dec. **1956.** 6 figs., 2 tables, 2 refs., 39 eqs. English summary p. 73. **DLC**—A general equation is derived for the development of the geostrophic fields. This equation leads to the definition of a function (S) of the pressure gradient and the temperature which plays an essential part in the discussion of the stability conditions of the pressure and temperature fields. The theoretical configurations of the pressure field, when S is constant in space, form well defined families of fields comprising all the stationary fields. By means of these families any complex field can be analyzed through its resolution into simple fields with symmetry properties with respect to their central meridians. A method for the rational classification of weather types can be based on this geostrophic analysis and is applied here to the European mean pressure fields for the months of July and January. *Subject Headings:* **1. Numerical forecasting 2. Geostrophic equations.**—*Author's abstract.*

9.5–120 551.509.312

§Ozorai, Zoltán, **Új szovjet módszer bevezetése az időjelző szolgálatba.** [Introduction of a new Soviet method into the forecasting service.] *Időjárás*, Budapest, 55(5/6):131–135, May/June **1951.** 2 figs. **DLC**—Thermobaric field analysis according to the Pogosian-Taborovskiĭ method has been in regular use in the Hungarian Meteorological Service for several months. The method is explained by showing its application to a particular synoptic situation, that of Feb. 1, 1951. This and several other cases show the great prognostic value of the method. *Subject Headings:* **1. Thermobaric field analysis 2. Pogosian-Taborovskiĭ method 3. Hungary.**—*G.T.*

9.5–121 551.509.313:551.515.23

Hubert, William E. (*Joint Numerical Weather Prediction Unit, Suitland, Md.*), **Hurricane trajectory forecasts from a non-divergent, non-geostrophic, barotropic model.** *Monthly Weather Review*, Wash., D. C., 85(3):83–87, March **1957.** 6 figs., table, 5 refs., 3 eqs. **DWB, DLC**—A numerical method for obtaining trajectories from non-divergent, non-geostrophic, barotropic forecasts is presented. The wind used in the computation of direction and speed of movement is derived from a Least Squares cubic surface fitted to sixteen stream-function values surrounding the point of interest. One-hour time steps are used. The method is applied to the forecasting of hurricane tracks and useful results are obtained for periods up to 36 hrs. Several other uses of trajectory forecasts are suggested. *Subject Headings:* **1. Trajectory forecasting 2. Hurricane track forecasting 3. Barotropic models 4. Numerical forecasting.**—*Author's abstract.*

9.5–122 551.509.313:551.513.2:551.557.5:551.577.37

Kikuchi, T., **The advection of jetstream core and the heavy rainfall.** *Journal of Meteorological Research*, Tokyo, 9(8):560–565, Aug. **1957.** 15 figs., 5 refs., 10 eqs. **DWB**—The heavy rainfall is often observed near the jet stream. The author analyzed the heavy rainfall in Tohoku District at the end of June, 1956, and obtained the following results: The heavy rainfall is considered as a type of instability rainfall, and it is usually observed under the mid-tropospheric convergence zone where the absolute vorticity is minimum in the vicinity of jet stream core. Assuming the conservation of absolute vorticity, the author developed a method of forecasting the dynamic instability associated with the jet stream core. *Subject Headings:* **1. Jet stream advection 2. Jet stream-heavy rainfall relationships 3. Dynamic instability forecasting 4. Tohoku District, Japan.**—*Author's abstract.*

9.5–123 551.509.314

§†Komabayasi, M.; Miyakoda, K.; Aihara, M. et al. (*all, Tokyo Univ. Geoph. Inst.*), **The quantitative forecast of precipitation with the numerical prediction method.** *Meteorological Society of Japan, Tokyo, Journal, Ser. 2*, 33(5):205–216, Nov. **1955.** 12 figs., 20 refs., eqs. **DWB, DLC.** Reprinted in *Collected Meteorological Papers, Tokyo*, 6(1/2), Dec. **1955.** Contribution No. 84. **MH-BH**—A quantitative forecast of precipitation based on the numerical prediction method, using three layer model of the atmosphere was made. Treating the

transport of water vapour three dimensionally and considering the temperature change, t excess of water vapour over saturation was estimated, which we assumed to fall off entirely precipitation. These calculations were performed by the graphical method designed FJØRTOFT, using the geostrophic approximation for the wind velocity. The North Americ Continent was chosen as the forecasting area. For 12 hr forecast, the coincidence betwe the observed and forecast precipitation was found to be fairly good, both in amount and are This result suggests the possibility of forecasting weather based on the large scale motion the air. Lastly, brief discussions were made on the non-adiabatic effect, which we disregard in our practical forecasting. *Subject Headings:* **1. Numerical precipitation forecasting 2. Fjø toft's graphical method 3. North America. I. Manabe, S. II. Katow, K.**—*Authors' abstra*

9.5–124 551.509.3

Cook Research Laboratories, Skokie, Ill., **A preliminary evaluation of isometric analys and forecast representation.** Contract AF 19(604)-1504, Special Report APR 87-2, Aug. 1 **1957.** 22+22 p. figs. **DWB** (M09 C771pr)—This report relates the evolution to date of chart designed to provide, first, an analysis of the existing aerological conditions over a extensive geographical area and through a vertical thickness of the atmosphere, and secon a representation of the changes expected to take place with time in this three-dimensio field. Specific data between the 30,000 foot level and the 45,000 foot level are needed for t particular operations of certain SAC aircraft, and this representation has been evolved order to exhibit as accurately as possible the synoptic aerological conditions and to indicat in a measurable manner, the changes expected with time. *Subject Headings:* **1. Upper a charts 2. Prognostic charts 3. Flight weather charts.**—*From authors' introduction.*

WEATHER CONTROL

9.5–125 551.509.6

Berry, F. A. and Berndt, Gerald D., **On the Oregon State College analysis of cloud seedi in the Tri-county area of Oregon.** *American Meteorological Society, Bulletin*, 38(8):497, Oc **1957.** table, ref. **DWB**—Comment on article by DECKER, LINCOLN and DAY (*see* 9.2–17 Feb. 1958, *MAB*) regarding the evaluation of 1950–54 cloud seeding operations in the T county area of Oregon, questioning the use of an 11-variable regression to estimate natur rainfall. A table shows that by using this technique, the chances of rejecting the null h pothesis, even if an actual 20% increase occurred in each of the 4 years, is small (about on fourth). *Subject Headings:* **1. Cloud seeding evaluation 2. Cloud seeding in Oregon 3. Nor Central Oregon.**—*M.R.*

9.5–126 551.509.6

Mount Washington Observatory, Gorham, N. H., **Operation overseed: interim report the Advisory Committee on Weather Control, Aug.–Nov. 1955.** Milton, Mass., Jan. 10, 195 unpaged. tables. Numerous charts and graphs. **DWB** (M09.67 B753oi 1955)—An analys of 17 silver iodide seeding operations conducted in Sept., Oct., and principally in Nov. 195 in the Mt. Washington, N. H. area show that on four occasions the ice nuclei count at t summit of Mt. Washington (6293 feet) was probably increased by one or more orders magnitude as a direct result of the seeding. The analysis further shows that on these occasio the optimum conditions of steep lapse-rate, absence of inversions and favorable air trajecto were obtained. On most of the occasions when an increase in the nuclei count could not detected, the atmosphere below the level of Mt. Washington was stable, an inversion w usually present. On one or two occasions when lapse-rate conditions were favorable, t wrong air trajectory was assumed. *Subject Headings:* **1. Operation OVERSEED 2. Clou seeding with silver iodide 3. Mt. Washington. I. Boucher, Roland J. II. Smith, Robert** —*Author's abstract.*

9.5–127 551.509.6

Sano, I.; Fujitani, Y.; Ito, K. and Kitani, S. (*Chemical Institute, Faculty of Scienc Nagoya Univ.*), **A field experiment of snow-making by seeding with nickel oxide.** *Meteor*

logical Society of Japan, Tokyo, Journal, Ser. 2, 34(4):185–189, Aug. **1956.** 2 figs., 2 tables, 9 refs. **DWB, DLC**—Nickel oxide has, next to silver iodide, an excellent ice-nucleating ability (nucleation temperature, −7°C). With the intention of testing its practical applicability to rain-making, we have performed a field experiment from January 27 to February 4, 1956 on the outskirts of Takayama City, Gifu Prefecture. Nickel oxide was prepared through thermal decomposition of the carbonate, and the powder obtained was sent up, after thorough pulverization, into the sky by a dust ejector. We have succeeded in deriving snow from the atmosphere at temperatures as low as −12° to −16°C, but never experienced, as expected, any appreciable snow-fall when the air temperature was higher than −7°C. In order to seek the diffusion of the nickel oxide smoke in the atmosphere, we have, keeping pace with the progress of experiment, tried detecting nickel oxide in the air around the seeding-station by a dimethyl glyoxime indicator method. The ice crystals, whose formation is considered to be due to the seeding, were fixed to replicas; they were classified according to their shape to plate-like, columnar, stellar, dendritic and so on; the size of the plate crystals was measured in particular and it was found to range from 30 to 210μ in diameter. *Subject Headings:* **1. Cloud seeding with nickel oxide 2. Cloud seeding in Japan.**—*Authors' abstract.*

9.5–128 551.509.617

†Schaefer, Vincent J. (*The Munitalp Foundation, Inc., Schenectady, N. Y.*), **Some relationships of experimental meteorology to arid land water sources.** (In: White, Gilbert F. (*ed.*), **The future of arid lands.** Wash., D. C., American Association for the Advancement of Science, **1956.** p. 300–313. table, 32 refs.) **DLC.** Also issued as: *The Munitalp Foundation, Inc., Occasional Papers*, No. 0018, **1956.** On the basis of an extensive review of the literature on induced rainfall, the author discusses, with special reference to the production in arid regions, the following pertinent subjects: variations in concentration of ice nuclei, importance of ice nuclei in controlling precipitation, importance of ice nuclei in regions like New Mexico, precipitation patterns resulting from orographic clouds in New Mexico, movement of air in valley bounded by mountain, effectiveness of AgI as a nucleus for ice crystal formations and future prospects for increased water supply from the atmosphere. *Subject Headings:* **1. Cloud seeding potentialities 2. Cloud seeding in arid lands.**—*I.L.D.*

STRUCTURE AND PHYSICS OF THE ATMOSPHERE

COMPOSITION OF THE ATMOSPHERE

9.5–129 551.510.41:546.3

Paul, I. I.; Vinogradova, V. A. and Medvedeva, I. V., **Mikrometod opredeleniia soderzhaniia olova v vozdukhe.** [Microscopic method of determining the concentration of tin in the air.] *Gigiena i Sanitariia*, Moscow, 22(3):83–86, March **1957.** 4 refs., 2 tables. **DLC**—The method described by the authors for determining the presence of small amounts of tin in the atmosphere is based upon the reaction of bivalent tin (SnO_2) with cacotheline. In acid solutions of SnO_2 cacotheline produces a violet color. The author describes the preparation of a standard solution of tin, the preparation of cacotheline, the sampling of the air and the determination of the amount of tin in the atmosphere. Numerical data are presented. *Subject Headings:* **1. Tin content of the atmosphere 2. Air sampling and analysis.**—*I.L.D.*

9.5–130 551.510.41:546.49

Polezhaev, N. G., **K metodike opredeleniia rtuti v atmosfernom vozdukhe.** [Method of determining mercury in the atmosphere.] *Gigiena i Sanitariia*, Moscow, No. 6:74–76, June **1956.** 2 figs. **DLC**—A method is described for absorbing mercury vapor from the atmosphere by means of an absorption apparatus and a fluid absorbing medium. The sensitivity of the method is enhanced by reducing the iodine content of the solution and by simultaneously increasing the sulfate concentration, since the decrease of copper iodide in the solution intensified the color of the precipitated mercury. A diagram of the apparatus is given and the application of the method is described. *Subject Headings:* **1. Mercury in the atmosphere 2. Air sampling and analysis.**—*I.L.D.*

ATMOSPHERIC POLLUTION

See: **Industrial site planning** (Topitz), 9.5–79.

ATMOSPHERIC STRUCTURE

See: **Conf. on Stellar Atmospheres,** 9.5–3.

UPPER ATMOSPHERE—IONOSPHERE

See also: **Upper atmos. photochemistry,** 9.5–5; **Ozone symposia** (Langlo), 9.5–38; **Ionosphere winds** (Harnischmacher), 9.5–200; **Eclipse effects on ionosphere** (Hennessey, Torres), 9.5–266.

9.5–131 551.510.5

Gowan, E. H. **Atmospheric ozone over Edmonton (Lat. 53°34′N Long. 113°31′W) 1951–** *I.U.G.G. Association of Meteorology, Rome, Sept. 1954, Scientific Proceedings.* Lond Butterworth, **1956.** p. 213–214. table. **DWB**—A brief summary is presented of the resu of three years of observation of ozone over Edmonton. The spring maximum appears March with a small secondary maximum in Aug. and Nov.–Dec. At all levels (100, 200, and 500 mb levels), the expected relation between ozone changes and the heights of th levels and the tropopause height was found and the best correlation appeared to be at 300 m A table gives the distribution of ozone with height as determined by the Umkehr meth *Subject Headings:* **1. Ozone 2. Vertical ozone distribution 3. Edmonton, Alberta.**—*I.L.D.*

9.5–132 551.510.534:546.

Kawamura, K. (*Met. Res. Inst., Tokyo*), **Results of the observation of atmospheric ozo at Tokyo.** *Meteorological Society of Japan, Tokyo, Journal, Ser. 2,* 34(4):231–234, Aug. 19 3 figs., table, 7 refs. In Japanese; English summary p. 231. **DWB, DLC**—The amount atmospheric ozone was observed at Tokyo during the period from June 1953 to Sept. 19 using a cadmium photoelectric tube and a glass filter. The observations were made at abo 11 a.m. on the day when there was no cloud in the direction of the sun. During this peri 217 independent observations were obtained and their absolute values were determined by series of comparative observation with Dobson spectrophotometer (No. 52) for the per April through Sept. 1955. With this comparative observation, it was ascertained that by present method the amount of ozone can be measured with good accuracy. The amount ozone shows a marked seasonal variation in respective years having the maximum value spring and the minimum in autumn. The course of annual ozone variation and its absol value agree well with the result obtained at Washington, D. C., in 1948–1950 by S. Fri *Subject Headings:* **1. Ozone amount 2. Ozone observations 3. Annual ozone variati 4. Tokyo, Japan.**—*Author's abstract.*

9.5–133 551.510.

Kay, R. H.; Brewer, A. W. and Dobson, G. M. B., **Some measurements of the verti distribution of atmospheric ozone by a chemical method to heights of 15 km from aircra** *I.U.G.G. Association of Meteorology, Rome, Sept. 1954, Scientific Proceedings.* Lond Butterworth, **1956.** p. 189–193. 2 figs., 4 tables, 4 refs. **DWB**—Quantitative data ozone concentration obtained by an adaptation of Emmert's chemical method are present These results show that (1) the amount of ozone below 12 km is on the average about 8. of the total amount; (2) there seems to be no regular discontinuity in the ozone moving ra at the troposphere and that (3) the beginning of the rise in the ozone concentration from predicted maximum near 22 km is sometimes detectable at about 15 km. Tables presen summary of the total amounts of low ozone measured in the first 16 aircraft ascents, the ozo concentration in the first 12 km of the atmosphere, ozone moving ratio variation with hei referred to the tropopause, etc. *Subject Headings:* **1. Vertical ozone distribution 2. Ozo concentration.**—*I.L.D.*

9.5–134 551.510.534

Miyake, Yasuo and Kawamura, K., **Studies on atmospheric ozone at Tokyo.** *I.U.G.G. Association of Meteorology, Rome, Sept. 1954, Scientific Proceedings.* London, Butterworth, **1956.** p. 172–176. 4 figs., 2 tables, 7 refs. **DWB**—Observations have been carried out since 1951 by means of a chromium photoelectric tube and glass filters. A seasonal variation in ozone amount was observed: the maximum in late spring and the minimum in autumn (shown on a graph). A positive deviation in ozone amount was found at the rear of a surface low with a warm sector. In the case of high pressure minimum values were usually at the rear of its center. The ozone amount increased after the passage of a cold front. The ozone amount was found to be greater in front of a trough and smaller in the rear. Also the relationship of ozone amount to the upper air temperature and the wind deviation at higher altitudes were observed. The summarized data are presented graphically and numerically. (For version in Japanese, *see* 6.9–141, Sept. 1955, *MAB.*) *Subject Headings:* **1. Ozone measurement techniques 2. Ozone variations 3. Tokyo, Japan.**—*I.L.D.*

9.5–135 551.510.534:541.14

Nicolet, Marcel, **Ozone variations above 50 km** (summary). *I.U.G.G. Association of Meteorology, Rome, Sept. 1954, Scientific Proceedings.* London, Butterworth, **1956.** p. 199–200. **DWB**—Above 50 km the atomic oxygen concentration is greater than the ozone concentration in daytime photoequilibrium conditions. The calculation of the vertical distribution of ozone is determined by the expression $n(O_3) = nO_2 k_2 n(M)_n (O_2) J_3$. The nighttime conditions above 50 km differ from daytime conditions and the maximum limiting value of ozone is given by the expression $n(O_3) = \frac{k_2}{k_8} n(M) n(O_2)$. Ozone is in photochemical equilibrium in a sunlit atmosphere above 50 km. Departures from photoequilibrium conditions come from the vertical distribution of oxygen atoms. *Subject Headings:* **1. Ozone variations 2. Photochemical equilibrium of ozone 3. Vertical ozone distribution.**—*I.L.D.*

9.5–136 551.510.534

Regener, Victor H., **New experimental results on atmospheric ozone.** *I.U.G.G. Association of Meteorology, Rome, Sept. 1954, Scientific Proceedings.* London, Butterworth, **1956.** p. 181–188. 5 figs. **DWB**—Graphical data are presented on the vertical distribution of atmospheric ozone, based upon distributions obtained in New Mexico between Feb. 1950 and Dec. 1953, atmospheric ozone in the boundary layer at levels from 40 cm to 1250 cm above the ground, surface ozone in New Mexico, atmospheric ozone in the Los Angeles region, and on the results of the direct spectrographic measurement of atmospheric ozone concentration. *Subject Headings:* **1. Vertical ozone distribution 2. Ozone concentration 3. New Mexico.**—*I.L.D.*

9.5–137 551.510.535:551.543:523.3

Matsushita, Sadami (*Geophys. Inst., Kyoto Univ.*), **Semidiurnal lunar variations in the sporadic-*E*.** *Journal of Geomagnetism and Geoelectricity,* Kyoto, 4(1):39–40, April **1952.** 2 figs., 6 refs. **DLC**—An analysis of the critical frequency of the sporadic E (fE_s) during summer solstice at Kokubunji, Japan, lat. 139°29.3′E, long. 35°42.2′N, for 1949–51 shows the semi-diurnal lunar variations in E_s. Harmonic analysis of these variations (shown in graph) gives an accurate picture of the significant variations. It shows that on the average the lunar semi-diurnal variation reaches its maximum amplitude of 35 Mc/s or 13% about 8 hours after the lunar culminations. The diurnal variations are usually of smaller amplitude than the semi-diurnal. It was not possible to study the variation in the Dec. solstice and the equinoxes because of the small number of occurrences of E_s. The amplitude of the E_s tide is greater than that in the E or F_2. *Subject Headings:* **1. Lunar semidiurnal tide in E_s 2. Sporadic E layer (E_s) variations at summer solstice 3. Kokubunji, Japan.**—*M.R.*

9.5–138 551.510.535

Pichler, H., **Studie zur Ionisation der E-Schicht.** [Study on E-layer ionization.] *Geofisica Pura e Applicata,* Milan, 33:146–152, **1956.** 7 figs., 3 refs., 2 eqs. English and German

summaries p. 146. **DLC**—The author presents graphical data on the behavior of the ex ponent in the equation $f_0F=C.(\cos x)^z$ upon the upper geographic latitude φ for a year wit sunspot minima (1945) and for one with sunspot maxima (1947), the variation of the z-valu with sunspot activity recorded at Maui during Jan., June, July, Dec. 1945, the dependenc of C upon solar activity, the dependence of z upon φ during months of Jan., June, July an Dec. for the region $-40°\leq\varphi\leq+40°$ and the dependence of C upon latitude. The exponer was found to be practically independent of sunspot activity, that Harnischmacher's formul expressing the relationship of C to sunspot activity was not found applicable the dependenc of z and C upon φ could scarcely be established clearly. *Subject Heading:* **1. E layer ionizatio** —*I.L.D.*

9.5–139 551.510.535:551.510.6

Pillet, Geneviève, **Sur le coefficient de réflexion des couches ionosphériques.** [Reflectio coefficient of the ionospheric layers.] *Académie des Sciences, Paris, Comptes Rendus*, 245(3) 335–338, July 17, **1957.** 7 refs. **DWB**—It is shown that the ionospheric reflection coefficien is considerably below unity (and not near unity as generally assumed) if the ionized layer in the lower ionosphere or the number of collisions between electrons and molecules is large *Subject Heading:* **1. Ionospheric reflection coefficients.**—*G.T.*

9.5–140 551.510.53

Sarma, N. V. G. and Mitra, A. P. (*both, Radio Research Committee, National Phys. La of India, New Delhi*), **Some aspects of the geomagnetic distortion of the F_2 region at equatoria latitudes.** *Journal of Scientific and Industrial Research, Sec. B*, New Delhi, 15(6):320–32 June **1956.** 4 figs., table, ref. **DWB, DLC**—A study of the diurnal variation in the critica frequency of F2 layer at equatorial stations such as Madras, Ibadan, Huancayo, Leyte Kodaikanal and Tiruchirapalli (all 7–13°N or S and 0 to 10°N or S geomagnetic lat.), show that the noon bite-out and the equatorial geomagnetic anomaly are a result of a strong sem diurnal vertical drift (downward flow of ionization at midday). Graphs show variations c P1 and P2 with magnetic dip for 1954. Variations of P1/P2 variations, sunspot number fc different equatorial stations, variations of critical sunspot number with magnetic dip an variation of P1 and P2 with sunspot number for Tiruchirapalli (10°50′N, 78°50′E) $(f_1-f_2)/f$ $=P_1$ and $(f_3-f_2)/f_2=P_2$ where f1, f2 and f3 are forenoon maximum, noon minimum an afternoon maximum critical frequencies of F2 layer. *Subject Headings:* **1. Diurnal F2 laye critical frequency variations 2. Geomagnetic distortion 3. Equatorial latitudes.**—*M.R.*

9.5–141 551.510.535:551.594.1

Sayers, J. (*Electron Physics Dept., Birmingham Univ.*), **Recent laboratory studies o recombination cross-sections.** (In: **Solar eclipses and the ionosphere: a symposium . . .** ed by W. J. G. Beynon and G. M. Brown. London, Pergamon, **1956.** p. 212–214. 3 figs. **DWB**—A special tube has been developed which, in addition to measuring the rate of disappear ance of ions or electrons in an afterglow following ionization, incorporates an R.F. mas spectrograph which identifies the ions at the same time. Provisional results of rate coefficient are given for oxygen and nitrogen for electron temperatures of a few thousand degrees. *Subjec Headings:* **1. Recombination processes 2. Ion recombination 3. Mass spectrometer analysis** —*Author's abstract.*

9.5–142 551.510.535:621.396.

Wait, James R. (*Natl. Bureau of Standards, Boulder, Colo.*), **The mode theory of VL ionospheric propagation for finite ground conductivity.** *Institute of Radio Engineers, N. Y. Proceedings*, 45(6):760–767, June **1957.** 7 figs., 14 foot-refs., 42 eqs. **DLC**—The spac between the earth and the ionosphere is considered as a waveguide with sharply bounded walls Employing a representation in terms of spherical wave functions of complex order, the field of a vertical dipole source is calculated for very low frequencies. It is shown that the effec of the finite conductivity of the ground is quite important for propagation to great distances Good agreement is obtained with the experimental results of J. Heritage. *Subject Headings* **1. VLF propagation 2. Ground conductivity.**—*Author's abstract.*

MECHANICS AND THERMODYNAMICS OF THE ATMOSPHERE

See also: **Weather and circulation, Feb. 1956** (Andrews), 9.5–181; **Northwesters and lower level convergence** (Bose), 9.5–196.

9.5–143 551.511:551.513

Aujeszky, László, **Az időjárás fizikája.** [Physics of weather.] *Természet és Társadalom*, Budapest, 115(3):150–155, March **1956.** photos., diagrs. **DLC**—Physical processes within the atmosphere are explained in a lucid manner and shown in schematic diagrams. The phenomena discussed are horizontal and vertical movements, cloud and precipitation mechanisms, the general circulation, pressure patterns, effect of cosmic factors upon weather, the atmospheric energy balance, and the solar radiation balance in the atmosphere. *Subject Headings:* **1. Atmospheric physics 2. General circulation.**—*G.T.*

9.5–144 551.511

Kolesnikov, A. G. and Pivovarov, A. A. (*Moscow Univ.*), **O vozmozhnosti vychisleniia rezul'tiruiushcheĭ teplovogo balansa na poverkhnosti vodokhranilishcha po temperature vozdukha.** [Possibility of calculating the resultant of the thermal balance on the surface of a reservoir from the air temperature.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, No. 5:534–540, May **1956.** 4 refs., 29 eqs. **DLC**—The author develops equations for calculating the resulting heat balance and its individual components from a knowledge of the air temperature, thermal characteristics of the reservoir and of the air layer immediately above the water surface. This includes the calculations of the turbulent heat exchange in the atmosphere over the water surface, the calculations of heat exchange and the resulting evaporation, and the calculation of turbulent heat exchange in the water. *Subject Headings:* **1. Heat exchange air-water surface 2. Reservoirs.**—*I.L.D.*

9.5–145 551.511.2:551.513.1

Henry, Robert M. and Hess, Seymour L., **A study of the large-scale spectra of atmospheric kinetic energy, wave speed, momentum flux, and heat flux.** Florida. State Univ. Dept. of Meteorology, Contract Nonr-1600 (00), Project NR-082-071, Technical Report, No. 9, March **1, 1957.** 30 p. 13 figs., 23 refs., 22 eqs. **DWB** (M055 F636t)—Methods are developed for determining the contribution by each harmonic wave component to the geostrophic kinetic energy of meridional and zonal motion, and to the geostrophic fluxes of angular momentum and enthalpy, and for finding the displacements of the waves. Evaluations are carried out for each day of Jan. 1951 for selected latitudes and pressure surfaces and the resulting spectral distributions discussed. Salient features are large spatial and temporal variations of the energy spectra, quasi-stationary or slow moving long waves, and unexpectedly small contributions by the higher wave numbers to the fluxes of momentum and heat. *Subject Headings:* **1. Kinetic energy spectrum in atmosphere 2. Angular momentum flux 3. Heat flux. I. Florida. State Univ. Dept. of Meteorology.**—*Authors' abstract.*

9.5–146 551.511.32

Elliott, Robert D., **Study of vorticity injections.** Aerophysics Research Foundation, Santa Barbara, Calif., Contract N189s-99279, Report 55-1, May **1955.** 11 p. 8 figs., 46 charts. **DWB** (M11 A252s)—Based on punched card tabulations for each 10° intersection, maps of Northern Hemisphere show mean monthly vorticity and mean monthly 500 mb surface height for each month from Jan. 1949 through Feb. 1952. Other maps show incidence of vorticity injections Sept.–May 1949–51, composite maps of downwind development in Atlantic and Pacific and development of blocking ridges. It was found that a vorticity injection is usually followed by development of anticyclonic vorticity (ridge) ahead of the injection, a trough downstream from the ridge, and a retrogressing trough behind the ridge. Monthly charts can be used as easily as daily charts to compute mean monthly vorticity injections. *Subject Headings:* **1. Vorticity injections 2. Northern Hemisphere vorticity charts 3. Northern Hemisphere.**—*M.R.*

9.5–147 551.511.33:551.5

King, Jean I. F. (*Geophysics Research Directorate, Air Force Cambridge Research Center*) **The radiative heat transfer of planet earth.** (In: Van Allen, James A. (*ed.*), **Scientific uses of earth satellites.** Ann Arbor, Univ. of Michigan Press, **1956.** p. 133–136. 11 eqs.) **DWA DLC**—A method is developed for obtaining the vertical temperature distribution of a planetary atmosphere from the law of darkening of the planet's emission spectrum. The intensity of the radiation emerging from a planet is directly dependent on the vertical thermal structure of its atmosphere. For the monochromatic case the emergent intensity is simply the Laplace transform of the Planck intensity considered as a function of optical depth. Now, for a given wavelength the Planck intensity is a single-valued function of temperature. Thus, in principle, a complete knowledge of the variation of the emergent intensity with zenith angle (law of darkening) suffices to determine the thermal structure of the accessible optical depths. In practice, to find the Planck intensity we must obtain the inverse Laplace transform, which is mathematically tantamount to solving a Fredholm integral equation of the first kind. An approximate solution to the problem is obtained using the Volterra method which replaces the integral equation by a set of linear simultaneous equations with the Planck intensity expressed as a series of step functions. A sample calculation shows that as few as three values of the limb-darkening function yield quantitative information on the vertical temperature distribution. Alterations in the theory necessitated by considerations of band, rather than monochromatic, intensity measurements are indicated. A lightweight, rugged instrument which appears capable of such thermal measurements is discussed. This is the far-infrared filter photometer currently being developed by The Johns Hopkins University under Air Force Contract AF 19(604)-949. *Subject Headings:* **1. Radiative transfer 2. Planetary atmospheres 3. Infrared filter photometers.**—*Author's abstract.*

GENERAL CIRCULATION

See also: **Jet stream-dynamic instability forecasting method, Japan** (Kikuchi), 9.5–122; **Atmos. physics** (Aujeszky), 9.5–143; **Kinetic energy spectra in atmos.** (Henry, Hess), 9.5–145; **Long wave statistics, Far East** (Tomioka), 9.5–156; **Topographic influence on jet stream** (Gambo), 9.5–258.

9.5–148 551.5

Murakami, T. (*Met. Res. Inst., Japan*), **On the seasonal variation of mean vertical velocity and atmospheric heat-sources over the Far East from spring to summer.** *Papers in Meteorology and Geophysics*, Tokyo, 7(4):358–376, Jan. **1957.** 9 figs., table, 10 refs., 32 eqs. **DWB**—In June, there is a marked zone of downward motion over the southern part of the Sea of Okhotsk, the maximum value of which reaches 10 ($mb \cdot 12\ hr^{-1}$) at 850-mb. It is also apparent that a distinct belt of upward motion extends from the south of Japan eastward along the latitude circle. Of considerable significance in the patterns of atmospheric heat sources in June is the existence of a broad zone of cooling over the southern part of the Sea of Okhotsk. The maximum value of this cooling at 850-mb is about -2×10^{-1} (cal gm 12 hr^{-1}). Such distributions of mean vertical motions and heat-sources show good correspondence with common experience concerning Baiu, which is the rainy season in Japan. *Subject Headings:* **1. Seasonal variation of vertical velocity 2. Seasonal variation of heat sources 3. Japan.**—*Author's abstract.*

9.5–149 551.5

Yeh, Tu-Cheng (*Inst. of Geophysics and Met., Academia Sinica, Peking*), **Maintenance of zonal circulation in the atmosphere.** *Acta Geophysica Polonica*, Warsaw, 5(2):65–73, 195 3 figs., 8 refs., 10 eqs. English summary p. 65. Polish summary p. 73. **DWB, DLC-** This paper attempts to explain the maintenance of zonal circulation in the atmosphere on the basis of a general equation of vorticity. The problem is divided into two parts, one of which refers to conditions in middle and high geographical latitudes and the other in low latitudes. Despite the introduction of necessary computational simplifications, the results obtained permit the conclusion that the zonal motion in middle and high geographical latitudes is maintained mainly by gross distribution (troughs and ridges) while the transport of angular momentum generated in the easterlies to the westerlies is mainly carried out by meridional

circulation. *Subject Headings:* **1. Zonal circulation 2. Meridional circulation 3. Angular momentum transfer.**—*Author's abstract.*

9.5–150 551.513.1:551.555.6

§Dunn, Carlos R. (*Extended Forecast Section, U. S. W. B., Wash., D. C.*), **The weather and circulation of April 1956: a cold month with a retrograding, blocking surge.** *Monthly Weather Review*, Wash., D. C., 84(4):146–154, April **1956.** 8 figs. (mostly weather charts), 4 tables, 12 refs. **DWB, DLC**—The monthly mean circulation of April 1956 and its development is discussed with special emphasis placed upon the blocking wave which retrograded slowly across North America. The distribution and amount of precipitation and the variations of the temperature in the U. S. are analyzed and tables listing unusual weather phenomena during the months such as floods, droughts, snowstorms etc. are presented. *Subject Headings:* **1. Blocking waves 2. Atmospheric circulation 3. Cold waves 4. North America.**—*I.L.D.*

9.5–151 551.513.1:551.524.2

Woffinden, Charles M. (*Extended Forecast Section, U. S. W. B., Wash., D. C.*), **Weather and circulation of November 1955: a month with pronounced blocking and extreme cold.** *Monthly Weather Review*, Wash., D. C., 83(11):272–278, Nov. **1955.** 9 figs., 2 tables, 13 refs. **DWB, DLC**—In Nov. 1955 severe winter weather with record-breaking cold and snow prevailed over northwestern United States. This paper contains a detailed analysis of the temperature distribution, the relationships between the observed temperature anomaly and the associated circulation pattern, the zonal index, blocking in the Atlantic and Pacific sectors, the precipitation and the Kona storms in the Hawaiian Islands. *Subject Headings:* **1. Temperature distribution 2. Blocking action 3. Extreme temperatures 4. Kona storms 5. United States 6. Hawaiian Islands.**—*I.L.D.*

9.5–152 551.513.2:551.557.5:551.524.7

Jansá Guardiola, José Maria, **La ecuación del viento térmico y la corriente a chorro.** [The thermal wind equation and the jet stream.] *Revista de Geofísica*, Madrid, 15(59):323–344, July/Sept. **1956.** 6 figs., 7 tables, 4 refs., numerous eqs. **DWB**—A theoretical consideration of the purely thermal and of the thermal-isobaric effects on the upper winds followed by application to the zonal circulation and finally the jet stream. The latter can be accounted for only by a consideration of "concentrating effects" on the zonal flow. Seasonal variations in the latter are considered and illustrated by cross sections and tables. *Subject Headings:* **1. Thermal wind field 2. Jet stream effects.**—*M.R.*

9.5–153 551.513.2:551.557.5 632.187

Schaefer, Vincent J. (*The Munitalp Foundation, Inc.*), **Jet streams and Project Skyfire.** *Munitalp Foundation, Inc., N. Y., Occasional Paper*, No. 0006, Jan. **1955.** unpaged. 6 photos., 17 refs. **DWB**—Various phases of the Munitalp Foundation's Jet Stream research are discussed. Cloud forms in relation to the jet stream, studies of clear air turbulence by oil-smoke ejection from jet aircraft and subsequent time-lapse photography of the persistent trail, the relation of stationary and travelling wave clouds to the jet stream, effect on cumulus clouds [several instances of cumulus clouds forming rapidly at ca. 20,000 ft above sea level (Mt. Gisborne, Idaho) and resulting in lightning storms were noted], and atmospheric electricity in relation to jet streams, are among the projects discussed. *Subject Headings:* **1. Jet stream research 2. High level thunderstorms 3. Project Skyfire.**—*M.R.*

9.5–154 551.513.3:551.58

Fukuda, K., **On the variations of the action centers in the Northern Hemisphere.** *Journal of Meteorological Research*, Tokyo, 8(12):737–744, Jan. **1957.** 8 figs., 4 tables, 7 refs., eqs. In Japanese, English summary p. 737. **DWB, DLC**—In this report, the author examined the fluctuations in the intensity, position, etc., of the action centers in the Northern Hemisphere. The principal results are as follows: 1) In high latitudes, large scale pressure deviations from normal show rhythmic variation, and the principal periods are about 10, 4, and 2 months. 2) Periodic variations with large amplitude were found at the meridians of 0°, 60°E and 180°E.

3) Cool summers over northern Japan are associated with semipermanent ridges at 60°F
Subject Headings: **1. Centers of action 2. Northern Hemisphere.**—*Author's abstract.*

9.5–155 551.513.7:551.543:551.52

Gião, Antonio, **Sur les champs de pression et de température quasi-stationnaires de l région alpine.** [Quasi-stationary pressure and temperature fields of the Alpine region. *La Météorologie*, Paris, Ser. 4, No. 45/46:283–290, Jan./June **1957.** 5 figs., 7 eqs. French English and German summaries p. 283. **DWB**—A general equation for the evolution of th geostrophic fields is first deduced. In this equation there appears a function (*S*) of the pressur gradient and the temperature which plays an essential part in the discussion of the stabilit conditions of the pressure and temperature fields. The theoretical configurations or pattern of the pressure field for different values of *S* can be compared to the observed fields and giv the basis of a method for the analysis of these fields and for the classification of weather type This method is applied to the mean European pressure fields and more particularly to th alpine winter and summer fields. *Subject Headings:* **1. Quasi-stationary pressure field 2. Temperature fields 3. Alpine Regions.**—*Author's abstract.*

ATMOSPHERIC DISTURBANCES

See also: **Tornado winds and pressure** (Dickson), 9.5–15; **Radar obs. of tropical cyclone, Queensland** (Brann et al.), 9.5–93; **Tropical cyclone analysis** (Ramage), 9.5–116; **Weather forecasting and hydrothermodynamic concepts** (Franke), 9.5–118; **Hurricane trajectory forecasts** (Hubert), 9.5–121; **Microseisms from storms, Indian Seas** (Tandon), 9.5–162; **Frontal type precip.** (Yasuda), 9.5–215.

9.5–156 551.515:551.513.

Tomioka, S., **A statistical study on the long wave over the Far East.** *Journal of Meteoro logical Research*, Tokyo, 9(7):475–479, July **1957.** 8 figs., 3 tables, 6 refs., 3 eqs. In Japanese English summary p. 475. **DWB, DLC**—In this paper, the author examined the displacemen of the long wave at 700 mb surface over the Far East, that is: (1) The relationship between the long wave and the transformation of the weather base; (2) Periodicity of occurrence of the long wave; (3) Displacement and retardation of the long wave; (4) Applicability of the Rossby formula to the long wave forecasting. The results are given in tables. *Subject Headings* **1. Long waves 2. Statistical studies 3. Far East.**—*Author's abstract.*

9.5–157 551.515.1

Radok, U. (*Univ. of Melbourne, Australia*), **A tropical disturbance observed in the Indian Ocean.** (In: Tropical Cyclone Symposium, Brisbane, Dec. 1956, **Proceedings.** Pub. Dec **1956.** p. 263–273. 8 figs., table, 8 refs.) **DWB**—A tropical disturbance (April 18–20 1956) consisting of a weak warm-core depression ringed by heavy precipitation is describe which appears to have resulted from the deformation of an originally straight low-level con vergence line by an upper westerly current with anticyclonic shear. *Subject Headings* **1. Tropical cyclone development 2. Tropical disturbances 3. Indian Ocean.**—*Author's abstract.*

9.5–158 551.515.11(213)

Bond, H. G. and Rainbird, A. F. (*both, Bureau of Met., Australia*), **Structure of tropical cyclones, with particular reference to those of 1955–56 in the Australian region.** (In: Tropical Cyclone Symposium, Brisbane, Dec. 1956, **Proceedings.** Pub. Dec. **1956.** p. 159–170. 7 figs., 2 tables, 4 refs.) **DWB**—The general structure of tropical cyclones with respect to cloud and rain distribution and surface wind, pressure, temperature and humidity patterns is considered, the examples being drawn mainly from the 1955 -56 season in the Australian region. A fairly detailed examination is made of rain distribution in the central area of tropical cyclones and of the characteristics of the "eye" and its surrounding wall. Where possible, comparisons are made with hurricanes and typhoons as described by Northern Hemisphere investigators. It is concluded that Southern Hemisphere tropical cyclones resemble their northern counterparts in, at least, those properties for which there are sufficient Southern Hemisphere data to

ustify a comparison. The occurrence of intense tropical cyclones appears to be less frequent n Australian waters than in the hurricane and typhoon areas of the Northern Hemisphere. *ubject Headings:* **1. Tropical cyclone structure 2. Hemispheric tropical cyclone comparisons . Australia 4. Northern Hemisphere 5. Southern Hemisphere.**—*Authors' abstract.*

9.5–159 551.515.3

§Gibbs, W. J. (*Bureau of Met., Australia*), **Two cases of cyclogenesis in tropical latitudes.** In: Tropical Cyclone Symposium, Brisbane, Dec. 1956, **Proceedings.** Pub. Dec. **1956.** p. 275–288, 12 figs., 11 refs., 4 eqs.) **DWB**—The formation, development and history of two disturbances are described, one occurring in summer (24–31 March 1956) and the other in winter (11–15 July, 1954). Both systems originated in low latitudes and acquired tropical cyclonic characteristics, later moving into baroclinic fields in higher latitudes. The likely processes associated with changes in the intensity of the circulations are discussed. The role of the "Durst-Sutcliffe" effect in the intensification and decay of "tropical" and "extra-tropical" depressions is examined. It is concluded that the basic process is essentially the same in both cases, the main distinction being that in the case of the tropical depression the baroclinicity is the result of the vertical motion, whereas in the case of the extra-tropical depression the pre-existing baroclinicity is deformed by the advection and vertical motion associated with the depression. *Subject Headings:* **1. Cyclogenesis 2. Tropical cyclones 3. Baroclinity.**—*Author's abstract.*

9.5–160 551.515.13:551.509.327

§Grundy, N. A., **Prognostic problems associated with the development of a Hatteras storm, Dec. 29–30, 1956.** *Canada. Meteorological Branch, CIR-2897*, TEC-248, March 25, **1957.** 11 p., 13 figs., 9 refs., 15 eqs. **DWB, DLC**—The rapid development of a Hatteras storm on Dec. 29, 1956, and its subsequent motion across the Bay of Fundy is investigated in terms of long-wave theory and the Sutcliffe and Petterssen development equations. *Subject Headings:* **1. Storm forecasting 2. Sutcliffe's development theory 3. Cape Hatteras, N. C.**—*Author's abstract.*

9.5–161 551.515.13

Raethjen, P., **The two types of sudden frontal cyclogenesis.** *I.U.G.G. Association of Meteorology, Rome, Sept. 1954, Scientific Proceedings.* London, Butterworth, **1956.** p. 497–500. 5 figs., 8 refs. **DWB**—The author considers only the cyclogenetic field in the "cyclogenesis core" near the coordinate center and examines mathematically the dynamic superpositions in the "cyclogenesis core," namely, "sudden cyclogenesis," insignificant meridional movement of coordinates, and "all-layer cyclogenesis" and the horizontal divergence, cyclogenesis, pressure change, and vorticity advection in the cyclogenesis core. The conditions under which the vorticity advection type and wedge injection type occur are discussed. *Subject Headings:* **1. Cyclogenesis 2. Frontal cyclogenesis.**—*I.L.D.*

9.5–162 550.342:551.515.2(26,54)

Tandon, A. N. (*Central Seismological Obs., Shillong*), **Microseisms from storms in the Indian Seas.** *Indian Journal of Meteorology and Geophysics*, Delhi, 8(1):33–42, Jan. **1957.** 4 figs., 14 refs. **DWB, DLC**—The present state of our knowledge of microseisms is summarised. A study of the microseisms recorded by the Seismological Observatories at Calcutta, Hyderabad, Kodaikanal, New Delhi and Poona, during the passage of the Bombay cyclone of Nov. 1948, Andhra cyclone of Oct. 1949 and the Bay cyclone of Dec. 1951, is presented. The results show that microseisms of significant amplitudes are recorded at all the stations only when the region of low pressure at sea reaches the stage of a cyclonic storm. The amplitudes then rise and fall simultaneously at all the Indian stations, reaching the maximum value at the same time. Microseisms are not recorded for all positions of the storms. The periods of microseisms generally show a rise with increasing amplitudes and seem to have no dependence on the distance. *Subject Headings:* **1. Microseisms from storms 2. Indian Seas.**—*Author's abstract.*

9.5–163 551.511

Tannehill, Ivan Ray, **The hurricane.** Rev. by the Office of Climatology, U. S. Weath Bureau. Wash., D. C., Weather Bureau, Rev. **1956.** 22 p. 24 figs., 2 tables. **DW** (M15.2 T166), **DLC** (QC945.T3 1956)—A general purpose brochure on tropical hurrica history, causes, formation, regions of formation, tracks, motion, eye of storm, frequen pressure, rainfall, storm surges, law of storms, signs, forecasts, warnings, radar and air connaissance, etc. The latest techniques and data (through 1955) are included in the te and illustrations of the revised edition. (For **1934** ed., *see* 7I–45, Sept. 1956, *MAB.*) *Subj Headings:* **1. Hurricanes 2. Hurricane monographs.**—*M.R.*

9.5–164 551.515.2:550.3

Upton, P. S. (*Univ. of Queensland*), **Microseisms associated with tropical cyclones ov the North-East Australian region.** (In: Tropical Cyclone Symposium, Brisbane, Dec. 19 **Proceedings.** Pub. Dec. **1956.** p. 205–209. fig., 3 refs.) **DWB**—In May, 1951, th Sprengnether 7 sec period horizontal component seismographs, giving a magnification of abc 12,000, were installed as a tripartite network at the University of Queensland, St. Lucia. the succeeding few years it became apparent that attempts to fix the position of the centers cyclones by utilizing the difference in arrival time of groups of microseisms at the three struments, were complete failures. This was in part, at least, due to the comparatively sm amplitudes recorded at Brisbane (much less than those recorded from comparable storms the Caribbean Sea area), the small amplitudes making sufficiently accurate measurements the time differences difficult or perhaps impossible. But it was felt that this was probab only part of the explanation, and since the beginning of 1955 work has been concentrated the gathering and analysis of data in the hope, ultimately, of being able to apply the micr ratio method of fixing centers. This work has been carried out by P. S. UPTON with, sin Jan., 1956, the valuable and essential co-operation of the Commonwealth Bureau of Mete ology. *Subject Headings:* **1. Microseism-cyclone relationships 2. Cyclonic microseism 3. Australia.**—*Author's abstract.*

RADIATION AND TEMPERATURE

RADIATION

See also: **Solar energy utilization** (Tabor), 9.5–77; **Radiation networks, Africa** (Drummond), 9.5–86; **Absolute radiometry and blackbody radiation** (Eppley, Karoli), 9.5–106; **Radiation flux meas. and pyrgeometers** (Ross, Tooming), 9.5–107; **Radiation meters and infrared radiation flux** (Pohl), 9.5–111; **Radiative heat transfer** (King), 9.5–147; **Breeze effects on radiation** (Sakali), 9.5–193.

9.5–165 551.5

*†London, Julius, **A study of the atmospheric heat balance.** N. Y. Univ. College of E gineering. Research Div. Dept. of Meteorology and Oceanography, Contract AF 19(122 165, Final Report, July **1957.** 99 p. 19 figs., 7 tables, 72 refs., eqs.—The radiative budg of the atmosphere is computed for the Northern Hemisphere for each of the four season Quantitative results are given for the vertical, latitudinal and seasonal distribution of t radiative heating and cooling of the atmosphere and the consequent energy budget. Earli estimates of the earth's planetary albedo of 35% are confirmed. It is shown that the avera annual distribution of radiation excess leads to a maximum northward heat transport at la 35–40°N of about 5×10^{16} cal min^{-1}. *Subject Headings:* **1. Radiation balance 2. Northe Hemisphere.**—*Author's abstract.*

9.5–166 551.521.1:551.588.2:6

*De Coster, M. and Schuepp, W., **Le rayonnement sur des plans verticaux à Stanleyvill Congo Belge.** [Radiation on vertical planes at Stanleyville, Belgian Congo.] *Belgiu Académie Royale des Sciences Coloniales, Classe des Sciences Techniques, Mémoires in 8°*, 2(5 **1956.** 47 p. 15 graphs (some fold.), 21 tables, 12 refs., 6 eqs. **DWB, DLC**—Extensi tables of direct and diffuse sun and sky radiation data obtained at Stanleyville in the Belgia

Congo during days with few clouds differentiated for clear and turbid (industrial) atmospheric conditions, and during different months, at different solar elevations (5° to 90°), or times of day (1/2 hourly), and on differently oriented slopes and on a horizontal surface, are presented and the data shown graphically for N, NE, E, SE, S, SW, W, NW and horizontal surfaces for each season. Eastward facing walls receive less radiation than west facing walls. Period of record is not given. *Subject Headings:* **1. Radiation on variously oriented surfaces 2. Radiation on horizontal surfaces 3. Stanleyville, Belgian Congo.**—*M.R.*

9.5–167 551.521.1(661)

*Masson, H., **La radiation solaire à Dakar.** [Solar radiation at Dakar.] *Dakar. Ecole Préparatoire de Médecine et de Pharmacie, Bulletins et Mémoires*, Vol. 2, **1954.** 21 p. 12 figs., tables, 11 refs. Abstracted from reprint.—A theoretical and observational study of global solar radiation at Dakar, based on data for 1951–54 but mainly for 1953. Comparisons are made graphically and in tables of the annual cycle for each separate year, of the difference between clear and cloudy days, of the relation between temp. and global radiation, water vapor content and global radiation, daily values corrected and uncorrected, and finally, application to photosynthesis. Records were obtained at Hann near Dakar (14°43′N, 17°26′W) with a Gorczíński solarimeter. Maximum temp. and vapor pressure is in Aug.–Oct.; minimum in Feb.–Mar. Maximum global radiation occurs in March–April and minimum in Oct. Average maximum = 640 ly/day, minimum 450 with daily extremes ranging from 800 to 80. *Subject Headings:* **1. Solar radiation data 2. Dakar, French West Africa.**—*M.R.*

9.5–168 551.521.1:551.521.11

Sauberer, Franz, **Über die Abhängigkeit der Tagessummen der Sonnenstrahlung von der Sonnenscheindauer in Wien-Hohe Warte.** [Dependence of total daily solar radiation on sunshine duration in Hohe Warte, Vienna.] *Wetter und Leben*, Vienna, 8(5/7):128–129, **1956.** fig., table, 3 refs. **DWB**—With the aid of a Stern pyranometer specially modified, it is possible to determine, from the difference between global radiation and sky radiation, the daily totals of solar radiation upon a plane surface and to compare these with running sunshine duration recording. The author discusses the fact that, during intermittent cloudiness, sunshine autographs record an excess of sunshine and indicate the effect of unequal distribution of cloudiness and daily radiation totals. It is shown that the disturbances caused by attenuation of the solar radiation during continuous recording of sunshine duration proceed in opposite directions. They produce a diminution of daily totals of radiation. A curve showing daily totals of radiation, as recorded by the Stern pyranometer and calculated by the formula of Nicolet and Dogniaux, is compared and good agreement is found for more than 60% sunshine duration. *Subject Headings:* **1. Solar radiation-sunshine duration relationships 2. Hohe Warte, Vienna.**—*I.L.D.*

9.5–169 551.521.1

Zakrent, Stefan, **Wyniki pomairów natezenia promieniowania słonecznego w Zakopanem i na Kasprowym Wierchu.** [Results of measurements of the intensity of solar radiation at Zakopane and at Kasprowy Wierch.] *Przegląd Meteorologiczny i Hydrologiczny*, Warsaw, 8(3/4):219–224, **1955.** 4 tables, 7 refs. French summary p. 224. **DWB, DLC**—The paper deals with results of such measurements carried out in 1953 and 1954 by J. Fedrovicz at Zakopane and by J. and M. Orlich at Kasprowy Wierch with the aid of Moll-Gorczyński solarimeters. They concern only intensity measurements of: 1) direct solar radiation (Q pyrh); 2) total radiations of the sun and sky on a horizontal surface (Q sol), and 3) sky radiation (Q dif.). The mean values are presented in tables 1, 2, 3. Table 4 shows the mean maximum values. It should be noted that the relationship Q pyrh (in percent) with clear sky fluctuates considerably from 8 to 50 at Zakopane, while at Kasprowy Wierch it varies only from 4 to 11, under the same conditions. It follows that even in the best atmospheric conditions solar radiation at Zakopane is in general considerably higher than in the other parts of Tatra Mountains. *Subject Headings:* **1. Solar radiation intensity 2. Zakopane, Poland 3. Kasprowy Wierch, Poland.**—*A.M.P.*

9.5–170 551.521.11/3:551.57

Miyakoda, K. (*Geophys. Inst., Tokyo Univ.*), **On the relation between solar incidence and cloud coverage.** *Meteorological Society of Japan, Tokyo, Journal*, Ser. 2, 35(2):94–104, Apr **1957.** 10 figs., 4 tables, 10 refs., eqs. **DWB, DLC**—A computing formula of the intensity of insolation which reaches the horizontal area on the earth's surface is presented, where the shielding effect of cloud, the absorbing and scattering effect of water vapour and air molecules and the variation of the sun's zenith distance are considered. In order to calculate the contribution of cloud coverage, a two layer model of cloud is used, and 0.44 and 0.36 are adopted as mean albedos of the lower and the upper cloud layers, respectively. For the determination of the transmission coefficient due to water vapour and air molecules, KIMBALL's graph is used. As the result, it is proved that the introduction of this effect improves the result considerably. *Subject Headings:* **1. Cloud effects on insolation 2. Absorption by water vapor.**—*Author's abstract.*

9.5–171 551.521.12(512.317

*Peacock, J. E., **Solar data for Hong Kong.** *Hong Kong. Royal Observatory, Technical Note*, No. 14, October **1955.** 11 p. 4 figs., 3 tables. **DWB**—Besides the astronomical data and charts for conversion of solar to standard time, solar declinations, elevation and azimuth, sunrise and sunset, civil and astronomical twilight and possible sunshine for Hong Kong, the normal daily duration of sunshine and total daily solar radiation at the top of the atmosphere over Hong Kong are given in graphical form. Text explains tables and graphs, and gives examples of computations. *Subject Headings:* **1. Solar data for Hong Kong 2. Sunshine data 3. Solar radiation data 4. Hong Kong.**—*M.R.*

9.5–172 551.521.1

Petherbridge, P. (*Building Res. Station, Watford*), **The computation and measurement of sky and daylight factors.** (In: Building Research Congress, Garston, 1951, **Papers presented in Division 3.** pub. **1951.** p. 162–166. 7 figs. (incl. photos), 23 refs. **DWB** (624 B932p)—The "Daylight Factor," which expresses the illumination obtainable at a point in a building is defined as "the illumination on a horizontal plane expressed as a percentage of that simultaneously obtained outdoors from a completely unobstructed sky, the effects of direct sunshine being excluded." The author discusses the methods for assessing sky and daylight factors, methods of measuring the sky factor, the accuracy of the daylight factor, factors influencing the measurement of the daylight factor, and methods of measuring the daylight factor. Photographs of apparatus used are reproduced and some results of measurements are given. *Subject Headings:* **1. Daylight illumination 2. Indoor illumination 3. Illumination intensity.**—*I.L.D.*

TEMPERATURE

See also: **Environmental influences** (Landsberg), 9.5–75; **Air temp. and humidity meas. improvement** (Bespalov), 9.5–85; **Thermogram analysis methods** (Dobrilović), 9.5–90; **Extreme temp. and blocking action** (Woffinden), 9.5–151; **Thermal wind field and jet stream effects** (Jansá Guardiola), 9.5–152; **Quasi-stationary pressure and temp. fields, Alps** (Gião), 9.5–155; **Temp. fluctuations and stellar scintillation** (Iudalevich), 9.5–270.

9.5–173 551.524:551.588:595.7

Haufe, W. O. and Burgess, Lawrence, (*both, Veterinary and Medical Entomology Unit, Entomology Div., Ottawa*), **Development of *Aedes* (*Diptera: Culicidae*) at Fort Churchill, Manitoba, and prediction of dates of emergence.** *Ecology*, Durham, N. C., 37(3):500–519, July **1956.** 8 figs. (incl. photos), 5 tables, 36 refs., 5 eqs. **DWB, DLC**—On the basis of continuous seasonal observations on mosquitoes in pools, their natural habitat, the authors discuss the relations between rate of development and thermal conditions of the environment and the relation between thermal conditions of the environment and meteorological phenomena in a subarctic area such as Fort Churchill. Correlation studies were carried out between pool temperatures on the one hand and air temperatures, wind velocity, solar radiation and precipitation on the other, in order to determine the quantitative effect of meteorological factors

pon the environmental temperature of immature mosquitoes. Then the average daily hermal effect of meteorological conditions on the water temperature in the mosquito pools was alculated. Computed and observational data are presented in tables and graphs. *Subject Headings:* **1. Weather effects on mosquitoes 2. Temperature effects on mosquito breeding 3. Mosquitoes 4. Fort Churchill, Manitoba.**—*I.L.D.*

9.5–174 551.524:634

Sabinina, I. G., **Vliianie temperaturnogo faktora na razvertyvanie pervykh list'ev shelovitsy v vesennii period v usloviiakh Uzbekistana.** [Influence of the temperature factor on he development of the first leaves of the mulberry tree during spring in Uzbekistan.] *Moscow. Tsentral'nyĭ Institut Prognozov, Trudy,* 37(64):20–26, **1954.** 7 tables, 5 refs. **DLC**—The levelopment of the first leaves of mulberry trees depends upon the spring temperature; the higher the mean temperatures for the period of transition of the mean daily temperatures hrough 5°C up until the phase of development of the first leaves (within temperature limits of 7°–14°C), the earlier does this phase begin. In order to forecast the dates of development of the first leaves, an effective temperature of A = 160°, with a lower limit of B = 5°, must be assumed for most of the districts in Uzbekistan, but for the southern districts (with the same lower limit B = 5°), the sum of effective temperatures must be assumed as 210°. The verification of the forecasts depends entirely upon the precision of long range forecasts. *Subject Headings:* **1. Temperature effects on mulberry leafing 2. Mulberry trees 3. Uzbekistan, U.S.S.R.**—*Based on author's abstract, & I.L.D.*

9.5–175 551.524.2:658.8

[Schenley Distillers Co.], **Thermal map of the United States to be used as a guide for summer promotion planning.** Developed by the Sales Promotion Dept., Dec. 27, **1954.** 1 p. table, map (fold.). **DWB** (M82.3/73 S324t)—The map presented is based on a study of 20-year average daily maximum temperatures in the U. S. Beginning and ending dates of the summer season (period when temperatures reach or exceed 70°) are indicated on the map for each state (or part of a state). *Subject Headings:* **1. Temperature charts 2. Merchandising 3. United States.**—*G.T.*

9.5–176 551.524.31

*Azuma, S. (*Saikyo Univ., Kyoto*), **On a new expression for the diurnal variation of air temperature.** *Meteorological Society of Japan, Tokyo, Journal,* Ser. 2, 34(6):297–307, Dec. **1956.** 2 figs., 6 tables, 6 refs., 18 eqs. **DWB, DLC**—A new expression $A_0+A \sin(\sigma t-\gamma \sin rt+\epsilon)$ is suggested by the author to show the diurnal variation of air temperature. Method for finding the four constants A_0, A, γ and ϵ is given and its applicability and the degree of approximation are discussed by some actual data. Physical remarks and some applications to climatology are also given in this paper. A noticeable success is the discovery of an expression with only the diurnal single period, not containing the semidiurnal or other higher harmonic periods which are of no physical significance. *Subject Heading:* **1. Diurnal temperature variations.**—*Author's abstract.*

9.5–177 551.524.32(54):551.581

*Jagannathan, P. (*Met. Office, Poona*), **Seasonal oscillations of air temperature in India and neighbourhood.** *Indian Journal of Meteorology and Geophysics,* Delhi, 8(2):155–168, April **1957.** 6 figs., 7 tables, 5 refs., 7 eqs. **DWB, DLC**—The annual and the half-yearly oscillations in the mean temperature of air at 4 ft above ground level at 167 meteorological stations in India and neighborhood have been separated. The dependence of the components of the vectors of the different oscillations on the location of the stations has been determined. Regression equations for representing the components of the oscillations as a linear function of lat., long. and elevation have been derived. The fit of these representations has been found to be fairly good, the correlation between the actual and the calculated values being of the order of 0.8 to 0.9, generally. The significance of the gradients with respect to the positional coordinates has been discussed. *Subject Headings:* **1. Seasonal temperature distribution 2. Climate of India 3. India.**—*Author's abstract.*

9.5–178 551.524.3

Borisova, L. G., **Makrosinopticheskie usloviia polozhitel'nykh anomaliĭ srednemesiachn temperatury vozduhka na Evropeĭskoĭ territorii SSSR v mae-oktiabre 1954 goda.** [Macr synoptic conditions of positive anomalies of mean monthly air temperatures in Europea Russia from May–October 1954.] *Meteorologiia i Gidrologiia*, Moscow, No. 8:28–31, Au **1956.** fig., 3 tables, 2 refs. **DWB, DLC**—The probability of persistence of a mean monthl temperature anomaly of the same sign over European U.S.S.R. and the causes of such a anomaly are investigated. All cases of positive anomaly of mean monthly temperatures f one or more months, observed over European U.S.S.R. during the period 1891–1953, a also cases where a positive anomaly over the European U.S.S.R. was accompanied by a sma negative anomaly at the periphery of this area were examined. Data on the frequency (numbers) of positive anomalies of air temperature over European U.S.S.R. as a function duration in months, probability of positive anomalies of mean monthly temperatures of vario durations, and index of meridional circulation (according to A. L. Kats), and a map showi the mean position of planetary frontal zones are presented. It is shown that cases of positi and negative temperature anomalies over the U.S.S.R. are accompanied by intense meridio circulation over the Northern Hemisphere. *Subject Headings:* **1. Temperature anomali 2. European U.S.S.R.**—*I.L.D.*

9.5–179 551.524..

Karapiperis, Leon N., **On the spells of cold weather over Greece during the sprin** *Athens. Panepistēmion. Ergastērion Meteōrologias, Demosieumata*, No. 4, **1956.** 19 10 figs., 8 refs.—An investigation of the cold spells and associated weather situations occurri over Greece during March and April during the period 1901–1940, based upon temperatu recorded at various weather stations in Greece and the Daily Historical Weather Maps of th Northern Hemisphere. The author discusses the determination and frequency of cold spel the next important cold spells and the synoptic situations associated with them, and a gener consideration of the weather situations associated with cold spells in the spring. *Subj Headings:* **1. Cold spells in Greece 2. Cold spell frequencies 3. Greece.**—*I.L.D.*

9.5–180 551.524.35

Péczely, Gyorgy, **Hőmérsékleti anomáliák tartamgyakorisága.** [Frequencies of durati of temperature anomalies.] *Időjárás*, Budapest, 61(1):54–56, Jan./Feb. **1957.** 2 fig table. **DLC**—Frequencies of specified lengths (in days) of positive or negative departur from normal temperature values were determined for Budapest for the period 1921–195 The frequencies obtained are listed separately for the summer and winter semesters and co pared with the frequencies which would result from chance distribution. The observed d partures of short duration (1 and 2 days) are much less numerous and those of long durati (4–55 days) much more numerous than chance probability. This is attributed to an effe of large-scale synoptic periods whose average duration is 5–8 days. A further analysis reve prevailing components of 6 and 11 days in winter and 5 and 11 days in summer. After elimin tion of these components the residual frequencies more closely resemble those of chan distribution. *Subject Headings:* **1. Temperature anomalies 2. Temperature frequenci 3. Budapest, Hungary.**—*G.T.*

9.5–181 551.524.36:551.513

Andrews, James F. (*Ext. Fore. Sec., U. S. W. B., Wash., D. C.*), **The weather and circul tion of February 1956, including a discussion of persistent blocking and severe weather Europe.** *Monthly Weather Review*, Wash., D. C., 84(2):66–74, Feb. **1956.** 10 figs., 3 table 15 refs. **DWB, DLC**—The weather and circulation of Feb. 1956 was characterized by complete reversal of the processes prevailing in Dec. and Jan. In the U. S., a strong zon circulation replaced a meridional one, bringing much-below-normal temperatures to the We and above normal to the East, light precipitation to the West and heavy to the East. Europe, Feb. was the coldest in memory, with a −24°F anomaly over the Alps and a temper ture of −4°F at Berlin on Feb. 24. A total of 16″ of snow occurred on the French Riviera deepest in memory. Verkhoiansk recorded −102°F (−74.4°C) late in Jan. and Mosco −49°F on Jan. 31. Center of the anomalous cold air mass over Eurasia was −400 ft (−24°

on the 700–1000 mb thickness chart. *Subject Headings:* **1. Atmospheric circulation anomalies 2. Cold winter, Europe (Feb. 1956) 3. United States 4. Europe.**—*M.R.*

SOIL TEMPERATURE

9.5–182 551.525:631.8

Dubovik, Ia. F., **Vliianie temperatury pochvy na effektivnost' udobrenii na chernozemakh severnogo Kazakhstana.** [Influence of soil temperature on the effectiveness of fertilizers on chernozem in Northern Kazakhstan.] *Pochvovedenie*, Moscow, No. 12:62–65, **1956.** 11 refs. **DLC**—Evidence is presented showing that, as far as the chernozem of northern Kazakhstan is concerned, the effect of fertilizer depends upon the spring weather and soil temperature. During a warm spring, nitrogen fertilizers are more effective and during a cold spring phosphate fertilizers prove more effective. A table is presented containing air temperature during April and May for each year 1940 and 1951–1954 for the Karohachysk weather station in the Kustanai Oblast. *Subject Headings:* **1. Soil temperature effects 2. Fertilizers 3. Chernozem 4. Northern Kazakhstan, U.S.S.R.**—*I.L.D.*

9.5–183 551.525.4

Chekotillo, A. M. (*Obruchev Permafrost Inst., Moscow*). **Izmenenie pochvennogo klimata v raïone Moskvy.** [Change in the climate of the soil in the Moscow region.] *Priroda*, 46(8):114–115, **1956.** **DLC**—A study of the soil temperatures at 0.5 m, 1.0 m, 1.5 and 2.0 m depths made since 1892 at the Mikhel'son weather station showed that, since the forties of the 20th century, there has been a gradual diminution in soil temperature. Data are given on minimum soil temperature during this period and are compared with those of the late 19th century and preceding years of this century. *Subject Headings:* **1. Soil temperatures 2. Moscow, U.S.S.R.**—*I.L.D.*

9.5–184 551.525.5:551.578.46

Hrbek, Josef and Krhounek, Slavomir, **Promrzání půd v zimě 1955–1956.** [Freezing of the soil during the 1955–1956 winter.] *Meteorologické Zprávy*, Prague, 10(1):16–23, **1957.** 15 figs., 8 refs. Russian summary p. 16. **DWB**—Data on air and soil temperature and snow cover thickness are presented graphically for 9 stations in western Czechoslovakia for three severe winters (1928/29, 1953/54 and 1955/56). Maps of Bohemia and Moravia showing depths of soil freezing, frequencies of specified minimum temperatures, and snow cover thickness are included. The choice of winters and stations was made in a way to allow comparison of similar temperature conditions with and without snow cover. It is shown that depth of soil freezing depends on several factors, snow cover thickness being one of the important ones. *Subject Headings:* **1. Soil freezing 2. Snow cover thickness 3. West Czechoslovakia.**—*G.T.*

WATER TEMPERATURE

9.5–185 551.526.8:536.22

Edmondson, W. T. (*Dept. of Zoology, Univ. of Washington, Seattle, Wash.*), **Measurements of conductivity of lake water *in situ*.** *Ecology*, Durham, N. C., 37(1):201–204, Jan. **1956.** 4 figs., 12 refs. **DWB, DLC**—The design, construction and operation of an apparatus for measuring the conductivity of lake water at various depths are presented and the results of conductivity measurements on the relationship between temperature and conductivity are discussed, and the data are presented in graphs. *Subject Headings:* **1. Heat conductivity of lakes 2. Heat conductivity instruments.**—*I.L.D.*

PRESSURE AND WIND

PRESSURE

See also: **Semidiurnal lunar tides** (Matsushita), 9.5–137; **Quasi-stationary pressure and temp. fields, Alps** (Gião), 9.5–155.

9.5–186 551.541 551.543

White, Marvin L. (*Natl. Bureau of Standards, Boulder, Colo.*), **Extension of the Sen-White paper on atmospheric oscillations.** *Journal of Geophysical Research*, Wash., D. C., 60(4):531–

532, Dec. **1955.** 5 eqs., 2 refs. **DLC**—The general solution of the radial wave equation obtained by SEN and WHITE (1955, *see* 8.7–225, July 1957, *MAB*) for gravitational and thermal waves in the atmosphere is extended to include a heat source function for an atmosphere of arbitrary temperature profile by numerical integration. Application can be made to solar semi-diurnal winds in E-region (*see* BRIGGS & SPENCER, **1954,** 6D–232, April 1955, *MAB*). *Subject Heading:* **1. Atmospheric oscillations.**—*M.R.*

9.5–187 551.542.

Kuhn, Walter (*Zurich*), **Horizontale Luftdruckgradienten in den Alpen nach Messungen im Gebiet des Kistenpasses.** [Horizontal air pressure gradient in the Alps according to measurements in the Kistenpass.] *Schweizerische Naturforschende Gesellschaft, Verhandlungen,* 134:105–109, **1954.** 2 figs., table. **DWB, DLC**—A study of air-circulation conditions in the tunnel of the projected Kistenpass was carried out by the way of 3 times daily barometer readings from June 1940 to May 1943 in Braunwald (1270 m) and Briegels (1292 m), on both sides of the northern Alps ridge. The resulting horizontal pressure gradients were then compared with pressure gradients of the 10 times longer line Basel-Lugano to see how the local pressure gradients compared with the gradients of the long line. An analysis of this dependence made synoptically on ground of particular cases, and statistically with the aid of tables, shows a positive correlation between both gradients, although the correlation coefficient is only 0.61. *Subject Headings:* **1. Horizontal pressure gradient 2. Kistenpass Alps.**—*A.M.P.*

9.5–188 551.547.1:551.509.31

Gales, Donald M. (*Meteorologist, TWA, Los Angeles*), **Report on the accuracy of computing 700 millibar heights by two methods from surface ship reports.** *Trans World Airlines, Inc., K. C., Missouri, Meteorology Technical Bulletin,* No. 49-2, Aug. 29, **1949.** 5 p. figs., tables. **DWB**—Two methods of computing 700 mb height from surface ship reports are tested. One method is the Weather Bureau's 700 mb height diagram, using pressure and temp. of surface ship reports as coordinates, with a small humidity correction. The other is the "700 mb Height Computer" designed by A. K. MORRIS of Pacific Gas and Electric of San Francisco. The mean vertical temp. of this column of air is computed from the surface pressure, temp. and cloud type and height to give the 700 mb height. Only ships sending Raobs were used. Positions ranged from 30°N to 49°N (and 140°–148°W). Results of 140 ship reports are tabulated. The computer was found to be more accurate than the diagram and both methods are more reliable at low than at high latitudes. Two-thirds of the values were accurate within 100 ft and 100% within 200 ft. *Subject Headings:* **1. 700 mb height computations 2. Ships' weather messages.**—*M.R.*

WIND

See: **Wind components, No. Atlantic** (O'Byrne, Connaughton), 9.5–87.

TURBULENCE

See also: **Airplane response method** (Vaccaro), 9.5–68; **Turbulence and astronomical seeing** (Gardiner et al.), 9.5–268.

9.5–189 551.551:532.5

Eckart, Carl (*Scripps Inst. of Oceanog., La Jolla, Calif.*), **Statistical hydrodynamics.** *Journal of Marine Research,* New Haven, Conn., 14(4):295–301, **1955.** 2 figs., 5 refs., eqs. **DWB, DLC.** Reprinted as *California. Univ. Scripps Institution of Oceanography, La Jolla, Contributions 1955,* issued July **1957.** p. 43–49. **DWB**—The difficulties of dealing simultaneously with non-linear equations and turbulence in hydrodynamic problems is pointed out, and the application of the statistical approach developed by G. I. TAYLOR is suggested. Two types of motion are distinguished, namely, random oscillation and random drift, and the distinction between the latter and random flight, which describes molecular diffusion, is considered. Finally, NORBERT WIENER's demonstrations that a random oscillation always has a continuous power spectrum, and vice versa, is applied to an analysis of random drift and

o the calculation about random oscillations and random drifts of water masses. *Subject Headings:* **1. Hydrodynamics 2. Turbulence.**—*I.L.D.*

9.5–190 551.551:551.556:551.311:631.4

*Kopanev, I. D., **Opyt rascheta turbulentnogo treniia.** [An attempt at calculating turbulent friction.] *Leningrad. Glavnaia Geofizicheskaia Observatoriia, Trudy,* 61(123):103–04, **1956.** table, eqs. **DWB**—A theoretical paper in which the author attempts to present a quantitative estimate of turbulent friction (of air against the soil) for virgin and non-cultivated land areas (at 7, 13 and 21 h) for 10 stations in May—the season when the dust storms are most probable. *Subject Headings:* **1. Soil erosion 2. Dust storms 3. Turbulence effects on soil.**—*A.M.P.*

9.5–191 551.551

Matschinski, M., **Sur les méthodes d'élimination des fluctuations aléatoires du champ hydrodynamique.** [Methods of eliminating fortuitous fluctuations of an hydrodynamic field.] *Journal Scientifique de la Météorologie,* Paris, 8(28):339–357, Oct./Dec. **1955.** 6 refs., 55 eqs. French, English and Spanish summaries p. 339. **DWB**—A long theoretical treatment of problems of turbulent fluctuations in hydrodynamics, both in a qualitative and a quantitative sense. Elimination of random fluctuations in the case of 3-dimensional motion, as well as for the 2-dimensional case, for incompressible and non-viscous fluids, and the spectrum of turbulence are considered. *Subject Headings:* **1. Statistical theory of turbulence 2. Random variations in hydrodynamics.**—*M.R.*

WIND DISTRIBUTION AND VARIATION

See also: **Wind field computation** (Iudin), 9.5–89.

9.5–192 551.552:551.556.2:626.1

Scheller, Hans, **Windschutz an Schiffahrtskanälen.** [Wind protection of navigation canals.] *Die Wasserwirtschaft,* Stuttgart, 47(6):141–152, March **1957.** 20 figs., 8 refs. **DLC**—During the period 1952–1954, the author made measurements of air flow over the Dortmund-Ems Canal at open sections, at sections with high tow paths and with low or high shelter belts. The layout and techniques of the measurements are described in detail, and the results obtained are presented. It is shown that shelter belts are superior to high earth banks. It is also found that protection against wind may safely be confined to a few prevailing directions of strong winds. Effective ways of placing shelter belts are suggested. *Subject Headings:* **1. Shelter belts 2. Airflow over canals 3. Navigation.**—*Trans. of author's abstract.*

9.5–193 551.553.11:551.521

Sakali, L. I., **Vliianie brizovoĭ tsirkuliatsii na napriazhenie radiatsionnykh potokov.** [Effect of breeze circulation on radiation flux.] *Leningrad. Glavnaia Geofizicheskaia Observatoriia, Trudy,* 50(112):83–86, **1955.** 3 figs., 3 tables. **DAWS**—On the basis of actinometric observations, made at the Odessa Geophysical Observatory for the period 1930–1940 and 1942–1952, and using only data for cloudless and clear days, the author investigated the effect of the breeze circulation upon each of the constituents of radiation balance. It is shown that the daily totals of radiation balance remain practically unchanged under the influence of the breeze circulation, since the diminution of effective radiation and increase in diffuse radiation are compensated by the decrease in direct radiation; the nocturnal totals increase perceptibly. Hence the total 24-hr radiational balance may increase 15–20% under the influence of the breeze circulation. *Subject Headings:* **1. Sea breeze circulation effects on radiation 2. Radiation balance 3. Odessa, U.S.S.R.**—*I.L.D.*

9.5–194 551.553.6(729.9)

*Macky, W. A., **Surface wind in Bermuda.** *Bermuda. Meteorological Office, Technical Note,* No. 7, **1956.** 31 p. 4 figs., tables. **DWB** (M055 B516t)—The original records for Hamilton (Fort George 222 ft above sea), Bermuda, were all lost by fire on Dec. 23, 1955, but some records have been reconstructed. The average, maximum and frequency of winds of

various speeds and directions (1932–54) are worked out and presented in tables and graph and discussed. One chart shows maximum gusts and another maximum hourly wind, and third maximum 10 min. speed reached on 10, 20, 40, 60, 80 and 90% of the days. Frequen of days with gales and with gales from 8 compass points, duration of gales, maximum gust longest duration of strong winds (>25, 39, 55, 64, and 75 mph), hurricane data, diurnal vari tions and relation between Fort George, and Hamilton Hotel wind speeds are presente *Subject Headings:* **1. Wind frequency studies 2. Gales 3. Bermuda.**—*M.R.*

9.5–195 551.554:534 534:629.135

Hawkes, Russell, **Wind, temperature predict sonic boom.** *Aviation Week*, 65(16):65–6 Oct. 15, **1956.** 3 figs. **DLC**—Dangerous shock waves may be experienced from jet plan flying at Mach 1.15 at 35,000 ft, even with no wind and a normal temp. gradient, and at low Mach numbers if winds or temp. gradients are favorable. Diagrams show effects of increasi head winds, or tailwinds (respectively), with altitudes, on the shape of the shock wave fro Decay with distance is extremely great—at 35,000 ft a 60 lb/sq ft pressure rise at 100 ft distan would decrease to <30 lb/sq ft at 500 ft and 3 lb/sq ft at 1000 ft. *Subject Headings:* **1. Shoo waves from jet planes 2. Wind shear effects on shock waves 3. Sonic boom.**—*M.R.*

SPECIAL WINDS

See also: **Cold waves and blocking action** (Dunn), 9.5–150.

9.5–196 551.555.6:551.511:551.509.317(5

Bose, B. L. (*Regional Met. Center, New Delhi*), **The nor'wester and the lower level con vergence.** *Indian Journal of Meteorology and Geophysics*, Delhi, 8(4):390–398, Oct. **195** 9 figs., 4 refs. **DWB, DLC**—A study of the field of convergence for a few days in nort wester season reveals that, though the afternoon northwester activity is invariably associate with the development of a field of convergence at lower levels, the velocity convergence, could be assessed even quantitatively from the wind field of the morning pibal ascents (02 GMT), does not seem to have significant prognostic value in the forecasting of subsequen northwester developments. *Subject Headings:* **1. Northwesters 2. Convergence.**—*Author abstract.*

WIND EFFECTS

See also: **Wind effects on bridges** (Tedd., Eng. Natl. Phys. Lab.), 9.5–78; **Industrial site planning** (Topitz), 9.5–79; **Wind protection of Canada** (Scheller), 9.5–192; **Wind effects on corona point discharge** (Chapman), 9.5–276.

9.5–197 551.556.2:551.311

Egerszegi, Sándor, **A szélerózió (defláció) leküzdése erdősávrendszerrel.** [Preventio of wind erosion by means of shelter belts.] *Időjárás*, Budapest, 55(5/6):152–161, May/Jun **1951.** table. German summary p. 182. **DLC**—In this first of two papers on wind erosio and shelter belts, the author discusses (with ample reference to Hungarian, Russian an German literature) the dependence of wind erosion on such factors as composition of the soi type of cover, method of cultivation, wind velocity, surface roughness, etc. An apparatus proposed for measuring wind-blown soil particles. (For Pt. 2, *see* 5.6–176, June 1956, *MAB Subject Headings:* **1. Wind erosion 2. Shelter belts 3. Soil conservation.**—*G.T.*

9.5–198 551.556.3:621.311.2

Ladács-Kiss, Aladár, **A szélerő hasznosításának kérdése a Rio de Janeiró-i világenergi konferencián és hazai vonatkozásai.** [Problem of wind power utilization at the Rio de Janei World Energy Conference and its applications to Hungary.] *Magyar Energiagazdasá* Budapest, 8(4):121–130, April **1955.** 13 figs., table. **DLC**—Three papers on progress i wind energy utilization in the U.S.S.R. (Adrianov and Sanov), Germany (Hütter), an Great Britain (Golding) are reviewed. Construction details of various high and low powe output wind generators are discussed and illustrated. In connection with the special surve of wind conditions in Great Britain, made by the Meteorological Office and described b

GOLDING, the author recommends that a similar survey be made in Hungary. Wind conditions in Hungary have unjustly been considered inadequate for energy utilization. Elevated points with average wind speeds of 10 m/sec can be expected to be found in areas of 5 m/sec average wind. *Subject Headings:* **1. Wind power 2. Wind utilization 3. Hungary.**—*G.T.*

9.5–199 551.556.8:551.482

Schmitz, H. P., **Über die vertikale Geschwindigkeitsverteilung in Kanälen und Flüssen und ihre Beeinflussung durch Wind.** [Vertical velocity distribution in canals and rivers and their dependence on wind.] *Acta Hydrophysica*, Berlin, 3(1):24–48, **1955.** 36 refs., 49 eqs. **DLC**—Author attempts to explain theoretically the observed vertical velocity distribution in water channels. In particular, the existence of a maximum velocity below the water level is explained by diminishing turbulence lengths towards the water surface. The wind is not necessarily the decisive factor in this respect, but possible wind effects on the velocity distribution are treated in a separate chapter. Prandtl's turbulence theory is found to be unsatisfactory, a modified Taylor assumption is being used. *Subject Headings:* **1. Vertical water velocity distribution 2. Wind effects.**—*A.A.*

UPPER AIR WINDS AND VERTICAL MOTION

See also: **Monthly mean wind fields, N. America** (Chiu), 9.5–88; **Streamline analysis techniques** (Showalter), 9.5–92; **Jet stream-dynamic instability forecasting method, Japan** (Kikuchi), 9.5–122; **Thermal wind field and jet stream effects** (Jansá Guardiola), 9.5–152; **Jet stream res. and Project Skyfire** (Schaefer), 9.5–153; **Topographic influence on jet stream** (Gambo), 9.5–258.

9.5–200 551.557:551.510.535

Harnischmacher, E., **Observation du vent ionosphérique.** [Observation of ionospheric wind.] *Annales des Télécommunications*, Paris, 12(5):159–161, May **1957.** 6 figs., 2 refs. **DLC**—Measurements of ionospheric winds made by the method of fadings at Neuf-Brisach, France (since Nov. 1955), at Cambridge, England, and at Kootwijk, Netherlands, are compared and found to be in fair agreement in respect to direction but less good for speed. *Subject Headings:* **1. Ionospheric winds 2. Radio fading.**—*G.T.*

9.5–201 551.558.2(542)

Raghavan, K. (*Met. Office, Poona*), **Vertical currents associated with standing waves over Mussooree.** *Indian Journal of Meteorology and Geophysics*, Delhi, 8(4):411–417, Oct. **1957.** 11 figs., 19 refs. **DWB, DLC**—Some observational evidences on the occurrence of vigorous vertical currents associated with standing waves over Mussooree are presented and discussed. Standing waves are found to have sufficient lift for gliders to soar to the stratosphere over Dehra Dun valley. *Subject Headings:* **1. Standing waves 2. Mussooree, India.**—*Author's abstract.*

AQUEOUS VAPOR, HYDROMETEORS AND HYDROMETEOROLOGY

HUMIDITY

See also: **Air. temp. and humidity measurement improvement** (Bespalov), 9.5–85; **Weighing hygroscopic substances** (Mahajan), 9.5–210.

9.5–202 551.571:551.501.771

Demidov, A. V. and Mokhov, L. A., **Opredelenie vlazhnosti vozdukha posredstvom indikatornykh trubok.** [Determination of atmospheric humidity by means of indicator tubes.] *Gigiena i Sanitariia*, Moscow, 22(2):64–66, Feb. **1957.** fig., 2 refs. **DLC**—The method of measuring the absolute humidity of small enclosed spaces described by the author is based upon the fact that a silica gel, impregnated with an aqueous solution of malachite green manganese, sulfate and zinc chlorate, assumes an orange color when desiccated, but in air it changes its color from orange to blue in the presence of moisture. Depending upon the

water vapor content of the air, the color change is either immediate or gradual. The co
struction of a device to determine absolute humidity is the basis of this principle; its use a
results obtained with it are described. *Subject Headings:* **1. Humidity measurement 2. H
midity instruments.**—*I.L.D.*

9.5–203 551.5

Taylor, H. Austin and Chen, Mei Chio (*New York Univ. Chemistry Dept.*), **The photolys
of water vapor.** New York Univ., Chemistry Dept. Contract AF 19(122)-426, Final Repo
1956. 29 p. 10 tables, 24 refs., 6 eqs. Also in: **The threshold of space,** ed. by M. Zeliko
N. Y., Pergamon Press, **1957.** p. 111–115. 3 tables, 5 refs., 5 eqs. **DLC**—The photolysis
water vapor has been studied in a flow system at flow rates up to 5 mol hr^{-1} and at temperatur
up to 540°K under the influence of a hydrogen discharge radiation around 1650 A. The effe
of helium as a diluent and of hydrogen initially added as a reactant for hydroxyl has bee
studied. The products are hydrogen, oxygen and hydrogen peroxide. It is concluded tha
hydrogen peroxide is produced only in the cold receiver trap. The overall quantum yield
therefore, in part, dependent on the geometry of the set up. Estimated values lying betwee
0.03 and 0.3 have been found. A mechanism for the process is discussed which centers arour
the reactions of H and OH produced in the primary process. The low quantum yield is a
counted for by a recombination of H and OH. Hydrogen peroxide results from a fixation
hydroxyls at liquid nitrogen temperatures. The gas phase reaction of hydroxyls accoun
for the oxygen production. The mechanism is substantiated by a study of the dependence
the observed rates on light intensity. *Subject Heading:* **1. Water vapor photolysis. I. N. Y
Univ., Chemistry Dept.**—*Authors' abstract.*

9.5–204 551.571.1:551.57

Drozdov, O. A., **Balans vlagi v atmosfere.** [Moisture balance in the atmosphere.] (I
Budyko, M. I. (*ed.*), **A. I. Voeĭkov i sovremennye problemy klimatologii.** Leningrad, 1956
p. 45–62. 11 figs., 7 refs., 20 eqs.) **DWB**—The equation for water balance for the earth
surface, the atmosphere and the earth-atmosphere system are presented, and the expressio
of the terms in these equations in forms suitable for calculating moisture balance of the eart
and atmosphere is set forth. In the U.S.S.R. and Central Asia, the difference between pr
cipitation and evaporation (May and July), the relationship of the moisture content of
column of air, the absolute humidity of the earth's surface (Jan. and July), the distribution
the moisture content ω (Jan. and July), the distribution of the coefficient of moisture utilizatio
f in period (Jan.–July), the distribution of the coefficient of moisture utilization f at 70% R
(Jan. and July), and the effect of evaporation upon precipitation, the influence of relief o
precipitation, etc., are analyzed mathematically. *Subject Headings:* **1. Moisture balanc
2 Hydrologic cycle 3. U.S.S.R.**—*I.L.D.*

9.5–205 551.571.

Byers, Horace R. (*Dept. of Met., Univ. of Chicago*), **Significance of different vertica
distributions of water vapor in arid and humid regions.** *Arizona. Univ. Institute of A
mospheric Physics, Technical Reports on the Meteorology and Climatology of Arid Regions*, No.
March 15, **1957.** 13 p. 2 figs., 2 tables, 10 refs., 6 eqs. **DWB**—The vertical distribution
water vapor can be expressed by an index coefficient which provides information about edd
and advective transports in a region, or in an air mass. The relationship between evapo
transpiration and eddy diffusivity of water vapor can be studied in this way. Striking diffe
ences in conditions between the arid Southwest and the remainder of the country are show
Subject Headings: **1. Water vapor vertical distribution 2. Arid zones.**—*Author's abstract.*

EVAPORATION AND EVAPOTRANSPIRATION

9.5–206 551.573:551.501.

Palmer, W. C. and A. V. Havens (*U. S. W. B., Off. of Climatology, Suitland, Md.*), **Graphic
method for the determination of evapotranspiration adapted from the Thornthwaite metho
prepared for the Weather Bureau short course in Agricultural Meteorology, July **1956.**
sheets 35×47 cm. 2 charts. **DWB** (M73 U587g)—Nomograms and instructions for the

use in climatology are presented. *Subject Headings:* **1. Evapotranspiration nomograms 2. Thornthwaite's method.**—*M.R.*

9.5–207 551.573:551.311.12

Peguy, Ch.-P., **Centrales et glaciers du Grossglockner.** [Grossglockner power installations and glaciers.] *Revue de Géographie Alpine*, Grenoble, 44(2):393–398, **1956.** fig., 4 refs. **DWB**—In a report on a conference of the Société Hydrotechnique de France held in Austria (at Zell-Am-See), the hydrological network and "Central Stations" and their capacities, in the Grossglockner region, are discussed, and data on the retreat of the glaciers since 1856 presented. The annual ablation of the Pasterze was about 1 m in 1910, and 3 m in 1953. About ¼ of the annual runoff of 35–40 million cu m of water is at the expense of the glacier, which has shrunk from 2.6 billion cu m in 1856 to 1.7 billion in 1954. The firn line has gone up from 2650 m in 1860 to 2900 m today. *Subject Headings:* **1. Glacial ablation data 2. Pasterze, Grossglockner, Austria.**—*M.R.*

9.5–208 551.573:551.579:551.501

*Radinovich, N. F., **Isparenie s poverkhnosti pochvy po nabliudeniiam Glukhovskoĭ agrometeorologicheskoĭ Stantsii.** [Evaporation from the soil surface according to observations at the Glukhov Agrometeorological Station.] *Moscow. Tsentral'nyĭ Institut Prognozov, Trudy*, 37(64):3–12, **1954.** 6 tables, 4 refs. **DLC** (QC851.M64)—The results of a ten year study of evaporation from the surface of the soil by means of a Popov evaporimeter-lysimeter are presented. The author discusses the method, including the formulas for working up the observations, the inadequacies of the methods and the Popov evaporimeter-lysimeter, evaporation from the surface of a cleared fallow surface with natural moisture supply, maximum possible evaporation and evaporation from a soil surface under barley. Extensive numerical data are presented in tables. *Subject Headings:* **1. Evaporation from land surfaces 2. Popov soil evaporimeter.**—*I.L.D.*

CONDENSATION

See also: **Condensation control in Arctic housing** (Roberts), 9.5–28.

9.5–209 551.574.1:061.3

American Geophysical Union. Committee on Cloud Physics, **Report on Activities, 1955.** Helmut Weickmann, Chairman. *American Geophysical Union, Transactions*, 37(4):523–524, Aug. **1956. DWB, DLC, NRL, DGL**—Contains a list of individuals attending the **Conference on the Physics of Cloud and Precipitation Particles,** held on Sept. 7–10, 1955 at Woods Hole, and of the papers delivered. *Subject Heading:* **1. Cloud physics conferences.**—*I.L.D.*

9.5–210 551.574.1:551.571

Mahajan, L. D. (*Brijindra College, Faridkot PEPSU*), **Weighing of hygroscopic substance in humid air.** *Science and Culture*, Calcutta, 21(11):668–669, May **1956.** fig., 2 refs. **DLC**—In humid climates during the rainy season, hygroscopic substances, soils and ceramics increase in weight, while being weighed, until they become saturated. The increase in weight is proportional to the lag of the time of exposure to humid air. This effect can be eliminated by (1) air conditioning the room, (2) air conditioning the weighing chamber, or (3) applying a correction based on empirical curves of increase in weight/time for various relative humidities of the air in the room. *Subject Headings:* **1. Hygroscopic substance weighing 2. Humidity effects on hygroscopic substances.**—*M.R.*

9.5–211 551.574.1

Maruyama, H. (*Met. Res. Inst., Japan*), **The formation of freezing nuclei on a plane.** *Papers in Meteorology and Geophysics*, Tokyo, 6(1):12–18, May **1955.** 12 figs. (incl. photos), 2 tables, 5 refs., eq. **DWB**—Small ice crystals were formed on freezing nuclei prepared on a cover glass plate coated with collodion film. AgI, $AgNO_3$–NaI and MgO smoke were used as nuclei. We found some interesting results. *Subject Heading:* **1. Freezing nuclei.**—*Author's abstract.*

9.5–212 551.574.1:551.578.1

*Okita, T. (*Geophys. Inst., Hokkaidō Gakugei Univ.*), **Interaction between atmospheri aerosols and raindrops.** *Meteorological Society of Japan, Tokyo, Journal, Ser. 2,* 33(5):220–22 Nov. **1955.** 10 figs., 3 tables, 4 refs. **DWB, DLC**—During the period from Aug. to Sep in 1954, the investigation of substances in raindrops and of aerosols in the air were made a several stations in the central part of Hokkaido. The results obtained are as follows. (1) Th size distribution of the particles is expressed by a formula $dN/dr = kr^{-4}$ for the range of partic radius r below 10μ, and for the particles of $r > 10\mu$, we have a formula $dN/dr = k'r^{-5}$; (2) Th number of large hygroscopic nuclei in the air is about 500/m³; (3) The number of large non hygroscopic particles of radii larger than 15μ in the air is about 4000/m³ and it seems that thes non-hygroscopic particles also serve as the nuclei of raindrops; (4) The mass of non-hygroscopi particles in raindrops is considerably larger than that of hygroscopic particles; (5) The large non-hygroscopic particles are captured by raindrops more easily than the smaller ones. *Subje Headings:* **1. Raindrop composition 2. Aerosol composition 3. Nuclei size distributio 4. Non-hygroscopic nuclei 5. Hokkaido, Japan.**—*Author's abstract.*

9.5–213 551.574.

Ruedy, R., **Undercooling and rate of condensation in steam.** *Canadian Journal o Research, Sec. A,* 22:77–94, Nov. **1955.** 4 figs., table, 14 refs., eqs. (National Researc Council of Canada (Reprint), No. 1217.) **DLC**—The first and most difficult stage in th condensation of water vapour is the increase in the size of the drops until their radius satisfie the KELVIN-HELMHOLTZ equation for the degree of undercooling or supersaturation reache at the temperature T_c of the vapour; the second stage is the increase in size by continue addition of molecules until the vapour pressure $p(v)$ of the drop containing v molecules ap proaches the pressure $p\infty$ exerted at the same temperature by a pool of water. A gradua enlargement to visible drops follows. Consideration of the number of collisions of the mole cules with the drops forming at the vapour pressure p_c of steam, and the loss of molecules b virtue of the higher vapour pressure of small drops leads to the conclusion that at condensatio temperatures between 0° and 50°C. the centers of condensation in the absence of dust or ion contain fewer than a hundred molecules. When the degree of supersaturation corresponds t larger drops, condensation is bound to fail. The conclusion drawn from the theory is con firmed by the values obtained in the tests with flowing steam and with cloud chambers. A higher temperatures larger drops act as nuclei. The growth in the second stage is also ex tremely rapid, at least until the radius equals in size the wave-length of visible radiation Water drops of this size, that is, drops that produce colored diffraction rings, behave as larg drops. The heat of condensation may furnish part of the work to be performed against th surface tension. *Subject Headings:* **1. Condensation of water vapor 2. Condensation proc esses.**—*Author's abstract.*

CLOUDS

See: **Contrail forecasting manuals** (U. S. A. W. S.), 9.5–17; **Cloud effects on insolation** (Miyakoda), 9.5–170.

PRECIPITATION

See also: **Fourier analysis and monthly rainfall data** (Bryson), 9.5–94; **Hydrologic yearbooks Genoa,** 9.5–96; **Jet stream-dynamic instability forecasting, Japan** (Kikuchi), 9.5–122; **Lang' "rain factor" and climat. classification** (Schaufelberger), 9.5–252.

9.5–214 551.577:519.2

Levert, C. (*Inst. Royal Mét de Bilt, Netherlands*), **Das Phänomen der Persistenz un dessen Auswirkungen bei statistischen Bearbeitungen.** [The phenomenon of persistence an how it affects statistical analysis.] *La Météorologie,* Paris, Ser. 4, No. 45/46:165–176, Jan. June **1957.** 2 tables, 31 refs., eqs. German, French, and English summaries p. 165. **DWB**— The author warns the reader against the omission of the persistence effect in the statistica treatment of rainfall data (e.g., daily precipitations totals) and in the use of statistical test First, the persistence effect is defined, then its measuring and consequences are discussed Among the latter are mentioned: a) variations in the frequency and the duration of the pre

ipitation periods, b) a decrease of the reliability of the probability of exceeding given quantities of precipitation during given periods, c) an increase of the range. *Subject Headings:* **1. Rainfall persistence 2. Rainfall analysis.**—*Author's abstract.*

9.5–215 551.577:551.515.82

Yasuda, K., **A case study of showers associated with a cold front.** *Journal of Meteorological Research*, Tokyo, 9(6):416–421, July **1957.** 7 figs., 7 refs. **DWB**—In this paper, the author presents an example of stripe-formed distribution of amount of precipitation by showers associated with a cold front in central Japan. Analysing the character of showers and synoptic situations, it is suggested that stripe-formed distribution is closely related to the existence of low-level jetstream above the precipitated areas, at about 500 to 700 mb levels in this case, with strong vertical wind shear below 700 mb level. *Subject Headings:* **1. Frontal type precipitation 2. Cold fronts 3. Central Japan.**—*Author's abstract.*

9.5–216 551.577.2/3(789,791,72)

Bryson, Reid A., **The annual march of precipitation in Arizona, New Mexico and Northwestern Mexico.** *Arizona. Univ. Institute of Atmospheric Physics, Technical Reports on the Meteorology and Climatology of Arid Regions*, No. 6, June **7, 1957.** 24 p. 11 figs., 3 tables, 9 refs. **DWB**—This report is concerned with the annual march of monthly precipitation amount in an area comprising the states of Arizona, New Mexico, Sonora, Sinaloa, Durango, and western Chihuahua. Fourier analysis was used to reduce the twenty-year mean monthly values to six harmonic terms, four of which were then plotted on charts and studied. The results of this study indicate that an area consisting largely of the Sierra Madre Occidental in northwestern Mexico, and the portion of Arizona southeast of Tucson constitute a single rainfall province with a strong summer maximum of rainfall. This province also has a winter maximum, but only in Arizona does the semi-annual term exceed the annual in amplitude. Within the U. S., the Gila and Rio Grande valleys constitute rainfall provinces of internally similar annual march, while the upland areas tend to resemble the Pacific coastal pattern to the west. *Subject Headings:* **1. Monthly mean precipitation amount 2. Arizona 3. New Mexico 4. Northwestern Mexico.**—*Author's abstract.*

9.5–217 551.577.2:551.579.4

Lauscher, Friedrich and Roller, Maria, **Bemerkungen zur Zeichnung der Niederschlagskarten für die Hochwasser-Wetterlagen im Juli 1954.** [Comments on the drawing of the precipitation charts for flood-weather situations in July 1954.] *Wetter und Leben*, Vienna, 8(12):235–240, **1956.** 2 figs., tables, 2 refs. **DLC**—The author discusses the basis upon which the precipitation charts for the precipitation associated with the Danube floods of July 1954 were drawn. The method of estimating the precipitation at high Alpine elevations where rain gauge measurements are either sparse or unreliable, interpolation of data for the valleys, etc., are discussed and the aid of numerical data presented in tables. These include the distribution of precipitation and elevations in the Sonnblick region, in the Achensee region and at the Upper Danube. Also a graph showing the dependence of precipitation upon elevation above sea level during June 1954 for these three regions and during the period 27 June–6 July, 1954 in the Southern Alpine areas is given. *Subject Headings:* **1. Precipitation charts 2. Flood rainfall 3. Floods, Danube (1954) 4. Alps.**—*I.L.D.*

9.5–218 551.577.2(914)

Manalo, Eugenio B. (*Chief, Clim. Div., Weather Bureau, Manila*), **The distribution of rainfall in the Philippines.** *Philippine Geographical Journal*, Manila, 4(4):104–167, Oct./Nov. **1956.** tables, 14 charts (most fold.), 10 refs. **DWB** (M77.2/914 M262d)—Monthly means of rainfall are tabulated for well over 400 synoptic and climatological stations of the Philippine Weather Bureau. The records represented vary in length, ranging up to 75 years. Isohyetal maps are constructed for each month and for the year. The characteristics of rainfall distribution in the Philippines are discussed month by month in considerable detail, along with the large-scale synoptic features and other factors responsible for the rainfall and its distribution. *Subject Headings:* **1. Rainfall distribution 2. Long period records 3. Philippines.**—*G.T.*

9.5–219 551.577.21 (56

*Paulhus, Joseph Louis (*Hydrologic Serv. Div., U. S. W. B.*), **Mean annual precipitati in the Tigris River basin above Baghdad.** 1 p. chart, map (each folded), dated Jan. 1 **1957. DWB** (M77.2/567 U587m)—A very large folded chart shows isohyets of mea annual precipitation at 100 mm intervals for the Tigris Basin of Iraq. From the few statio with good records, precipitation-altitude relations up to 6,000 ft are worked out graphical (for both sheltered and nonsheltered sites), and from these relations the map was constructe Methods are outlined. *Subject Headings:* **1. Isohyetal charts 2. Precipitation-height rel tionships 3. Tigris Valley, Iraq.**—*M.R.*

9.5–220 551.577.37 (78/

*U. S. Weather Bureau, **Rainfall intensities for local drainage design in the United Stat for durations of 5 to 240 minutes and 2-, 5-, and 10-year return periods, Pt. 1: West of th 115th Meridian.** Its *Technical Paper*, No. 24 (Pt. 1), Aug. **1953.** 19 p. 13 figs., 3 table foot-refs. **Pt. 2: Between 105°W and 115°W.** *Technical Paper*, No. 24 (Pt. 2), Aug. **195** 9 p. 7 figs. **DWB**—Reports were based on data already available for dozens of stations the Far West and Rocky Mountain regions, respectively, analyzed in a number of ways to sho in tables, graphs and on charts the intensity, duration frequency values for various perio from 5 to 240 min. The difference in frequency curves based on short and long records shown for Kalispell, Mont., for 1940–51 and 1899–1951, respectively; and on a chart for 194 51 compared to total period of record for 30 stations in the West—first for hourly rainfall ar second for max. hourly precip. The former data show no regular pattern of variation; in th latter case the mean slope was 112%. *Subject Headings:* **1. Rainfall intensity duration char 2. Rainfall depth duration data 3. Western United States.**—*M.R.*

9.5–221 551.577.37 (73,798,914,729.

*U. S. Weather Bureau, **Rainfall intensity-duration frequency curves for selected statio in the United States, Alaska, Hawaiian Islands and Puerto Rico.** Its *Technical Paper*, No. 2 **1955.** 53 p. 5 refs. mostly graphs. **DWB, DLC**—Rainfall intensity duration curves for min to 24 hours for 2, 5, 10, 25, 50 and 100 year return periods are presented for 203 U. S. W. stations in the U. S., Alaska, Hawaii and Puerto Rico (arranged alphabetically by states using the GUMBEL (1941) method of extreme annual values (on log-log paper). It is interestin to note that all of the curves for stations east of the Pacific Coast range curve sharply downwar with increasing time, whereas those stations along the immediate Pacific Coast give an almo straight line (log-log) relation. *Subject Headings:* **1. Rainfall intensity duration curve 2. United States 3. Alaska 4. Honolulu, T. H. 5. San Juan, Puerto Rico. I. Gumbe E. J.**—*M.R.*

9.5–222 551.577.37 (7

*U. S. Weather Bureau, **Rainfall intensities for local drainage design in Western Unite States, for durations of 20 minutes to 24 hours and 1- to 100-year return periods.** Its *Technic Paper*, No. 28, Nov. **1956.** 46 p. 41 figs., 3 tables, 11 refs. **DWB**—Two-year, one, six an 24-hour rainfall charts for 6 sub-areas of the Far West (105°–125°W) and charts showin ratio of 100-year to 2-year, one hour, six hour, and 24-hour rainfall, respectively, for the sam areas, are presented with extensive annotation and explanation. Nomograms and scatte grams show depth-intensity-duration relations with respect to return period. Isohyets a based on data from 200 long period records, and are essentially the same as in *U. S. W. Technical Paper*, No. 24 (*see* 9.5–220). *Subject Headings:* **1. Rainfall intensity duration char 2. Rainfall depth duration data 3. Western United States.**—*M.R.*

RAIN AND SNOW

See also: **Holes in refrozen snowmelt water** (Hoinkes), 9.5–59; **Aerosol-raindrop interaction** (Okita), 9.5–212.

9.5–223 551.578.

Litvinov, I. V., **O spektre dozhdia.** [Spectrum of rain.] *Akademiia Nauk SSS Izvestiia, Ser. Geofiz.*, No. 1:114–116, Jan. **1956.** 2 figs., 4 refs., eqs. **DLC**—The auth

nvestigates the relationship between the spectral distribution of rain drops and rain intensity, ısing observations made during an expedition to the Elbrus in 1952. It was found that the ain spectrum depends not only upon its intensity at a given moment, but also upon the ariation of intensity. The usual formula for rain spectra, with constant parameters of listribution, are not adequate. *Subject Heading:* **1. Raindrop size distribution.**—*I.L.D.*

9.5–224 551.578.4(52)

*Itoo, K. (*Met. Res. Inst.*), **On the snowfall in Tokyo.** *Papers in Meteorology and Geophysics*, Tokyo, 6(2):116–125, Sept. **1955.** 19 figs. (incl. photos), 2 tables, 5 refs. **DWB**—The snowfalls in Tokyo were observed 8 times from 1953 through 1955. Pictures of snowflakes were taken and the size of their particles was measured with the powders of water blue. In Tokyo, snow falls at higher temperature. Its crystal forms are needle, dendrite and snow pellets, all of which are rimed crystals. *Subject Headings:* **1. Snowfall data 2. Snow properties 3. Tokyo, Japan.**—*Author's abstract.*

HYDROMETEOROLOGY

See also: **Land hydrology** (Chebotarev), 9.5–7; **Hydrologic forecasting** (Belinskiĭ), 9.5–11; **Moisture balance** (Drozdov), 9.5–204; **Evaporation from soil surface** (Radinovich), 9.5–208; **Precip. charts for floods** (Lauscher, Roller), 9.5–217; **Snow melt runoff** (Shimada), 9.5–229.

9.5–225 551.578.41

Litvinov, I. V. (*Geophysical Inst., Acad. Sci. USSR*), **Opredelenie ustanovivsheĭsia skorosti padeniia chastits snegopadov.** [Determination of the terminal velocity of snowflakes.] *Akademiia Nauk SSSR, Izvestiia, Ser Geofiz.*, No. 7:853–856, July **1956.** 10 figs., (photos, graphs), 3 refs. **DLC.** Trans. into English by E. R. Hope. Issued as *Canada. Defence Research Board, T238R*, Jan. **1957.** 4 p. 10 figs., 3 refs. **DWB**—In order to calculate from the spectral distribution of snow flakes captured on filter paper their distribution in the air, it is necessary to determine the rate of fall of solid particles of varying mass. The author reviews briefly the work of LANGLEBEN on the terminal velocity of snow flakes and then describes a specially designed device for measuring the terminal velocity of falling solid particles together with their shape. Photographs of particles on the filter paper and graphs showing the results of measurements of the diameters and terminal velocities of particular shapes of snow flakes are presented. *Subject Headings:* **1. Snowflake diameters 2. Snowflake velocity.**—*I.L.D.*

9.5–226 551.578.45(782)

§Jacobson, Henry L.; Sanders, Robert A. and Hanson, Donald M. (*W.B. District Forecast Center, Kansas, Mo.*), **The central high plains storm of November 1–3, 1956.** *Monthly Weather Review*, Wash., D. C., 84(11):401–414, Nov. **1956.** 23 figs., 4 refs., 3 eqs. **DWB, DLC**—Storm gave up to 20″ of snow to Northwestern Nebraska, with winds of 50–70 mph, huge drifts, traffic stoppage, etc. An unusually complete synoptic (surface and upper air) case history study of all stages of the development and filling is presented. Vertical theta prime charts (θ') were found to be useful in predicting the development of the storm. These charts are reproduced for Nov. 1–3, 1956. Near saturation they suggest isentropic movements. They also indicate amount of and changes in vertical stability. *Subject Headings:* **1. Snowstorm, Nebraska (Nov. 1956) 2. Synoptic case histories 3. Northwest Nebraska.**—*M.R.*

9.5–227 551.778.45(494)

Janner, Adriana and Thams, J. C. (*Locarno-Monti*), **Ein Bergdorf wird von der Umwelt abgeschnitten. (Der Winter 1950/51 in Bosco-Gurin).** [A mountain village is cut off from the world in the winter of 1950/51 in Bosco-Gurin.] *Die Alpen*, Bern, No. 12, **1951.** 5 p. fig. **DLC**—The effect of the heavy snowfall that fell in the Alps during the winter 1950/1951 upon the village of Bosco-Gurin in Tessin, Switzerland, is described. The article contains a general description of the weather conditions during the winter of 1950/51, the amount of snowfall and height of snow cover, which is illustrated by a graph, and of the damage caused by the snow. *Subject Headings:* **1. Excessive snowfall 2. Bosco-Gurin, Switzerland.**—*I.L.D.*

9.5–228 551.578.46:6

Landauer, J. K. and Royse, Frank, **Energy of snow compaction and its relation to traffi ability.** *U. S. Snow, Ice and Permafrost Research Establishment, Research Paper*, No. Oct. **1956.** 11 p. 10 figs., 2 tables, 6 refs. **DLC?** –Penetrometer tests were performed in t field on natural snow to determine the work of compaction. It was found that the work p unit area was independent of the penetrometer area and was not a strong function of veloci The power used to compact snow is much less than that available from over-snow vehicl Other effects must be responsible for the high observed energy losses. *Subject Headin* **1. Snow cover compaction 2. Snow trafficability 3. Snow properties.**—*Authors' abstract.*

9.5–229 551.578.46:551.57

Shimada, M., **Measurement of the amount of snow melt and its application to run forecast.** *Journal of Meteorological Research*, Tokyo, 9(5):305–313, July **1957.** 13 fig table, 8 refs. In Japanese; English summary, p. 305. **DWB, DLC**—In the season of sno melt 1954–1955, we measured the amount of snow melt (as the transmission water throu snow layers) with transmission gauge (dia. 80 cm), set on the ground. Obtained results a as follows: (1) In the early season of snow melt, the catch ratio of the gauge is less than norm and in the active season, it is too much; (2) Coefficient of snow melt caused by temperature $0.02 \sim 0.04$ gr cm^{-2} deg^{-1} day^{-1} (early season), and $0.40 \sim 1.60$ gr cm^{-2} deg^{-1} day^{-1} (acti season); (3) The time lag between the air temperature and the transmission is proportion to the depth of snow, though disturbed by rain. Further, we investigated the relation b tween the amount of transmission water and the runoff, measured at the same place (bas area is 277 km^2). Obtained results are as follows: (4) The time lag between the transmissi and the runoff is proportional to the antecedent transmission index, though disturbed by rai (5) The degree day factor correlates with the transmission and the depth of snow; (6) T relation between the transmission and the runoff also correlates with the minimum of run or the antecedent transmission index; (7) From the above relations we can construct the c axial graph to forecast the runoff from temperature. *Subject Headings:* **1. Snow melt run 2. Runoff forecasting.**—*Author's abstract.*

9.5–230 551.578

Rajeswara Reo, N. (*Dept. of Physics, Nizam College, Hyderabad*), **Severe hailstorm Secunderabad on March 11, 1957.** *Indian Journal of Meteorology and Geophysics*, Delh 8(3):349–350, July **1957.** ref. **DWB, DLC**—From 1350 to 1405 IST on March 11, 195 piles of hailstones fell at Secunderabad in a few minutes. Winds reached 60 to 90 mp Structure of stones up to $2\frac{1}{2}''$ diameter were studied by the author. All had an opaque nucle of 2 mm diameter, with opaque rings of varying diameter up to 6 to 10 mm from center, su rounded by a transparent region up to 16 mm, then two thick elliptical rings from 16–33 m and lastly a wavy or toothed outer ring. It is thought that outer structure is due to cohesi of small hailstones on striking the parent stone (which has a thin film of supercooled wate and not to unduly strong updrafts. *Subject Headings:* **1. Hailstone structure 2. Secunder bad, India.**—*M.R.*

9.5–231 551.579:628

Dorroh, John H., Jr. (*Soil Conservation Service, U. S. Dept. of Agri., Albuquerque, N. M* **Beneficial use of water in arid lands.** (In: White, Gilbert F. (*ed.*), **The future of arid land** Wash., D. C., American Association for the Advancement of Science, **1956.** p. 156–16 ref.) **DLC**—A summary of the results of a study carried out in Arizona, Colorado, New Mexi and Utah to determine (1) the average annual precipitation, (2) the part of the original supp of precipitation available for irrigation and other uses, (3) the watershed and climatic facto predominant in the production of water yield, and (4) possible measures for reducing wat losses to non-beneficial use. *Subject Headings:* **1. Water supply survey 2. Precipitatio estimation 3. Irrigation calculations 4. Southwest United States.**—*I.L.D.*

9.5–232 551.579.4:551.57

Neumann, J. (*Israel Met. Serv.*), **On the water balance of Lake Huleh and the Hule Swamps, 1942/43–1946/47.** *Israel Exploration Journal*, 5(1):49–58, **1955.** 2 tables, 10 refs

0 eqs. **DLC.** Reprinted as *Israel. Meteorological Service, Ser. D, Contributions*, No. 5.—he water balance of Lake Huleh and the Huleh Swamps for the period 1942/43–1946/47 is as ollows: inflow in the Jordan at Huliyath = 490×10^6 m³/yr; precipitation over the lake and wamps = 25×10^6 m³/yr; runoff from the catchment between Huliyath and the Bridge of the Daughters of Jacob (as computed by an empirical regression formula) = 140×10^6 m³/yr; vapotranspiration from the swamps = 35×10^6 m³/yr and evaporation from the lakes = 25×10^6 m³/yr. The computed total inflow of 595×10^6 m³/yr compares with a measured surplus of 590×10^6 m³/yr. The equations for calculating evaporation and evapotranspiration are leveloped and it is shown that evapotranspiration rates from an extensive vegetation surface re less than that from an adjacent water surface. *Subject Headings:* **1. Hydrologic cycle 2. Evapotranspiration 3. Lake Huleh, Palestine.**—*I.L.D.*

9.5–233 551.579.1:551.577.2(522)

Fukuoka District, Japan. Central Meteorological Observatory, **Hydrometeorological studies of the Chikugo River.** *Journal of Meteorological Research*, Tokyo, 9(8):545–559, Aug. **1957.** 19 figs., 11 tables, eqs. **DWB**—This report is the hydrometeorological study of the upperstream of "Yoake" in the area of the River Chikugo. The main items of the investigation are as follows: 1) Rainfall distribution and intensity for track of cyclone and typhoon. 2) Maximum possible precipitation and return period of daily precipitation. 3) The relationship between the hourly rainfall and the total. 4) D.D.A. value, and its annual change. 5) Run-off, and coefficient of run-off of the branch streams Oyama and Kusu. 6) Flood forecasting by use of hourly precipitation. *Subject Headings:* **1. Hydrometeorological studies 2. Rainfall distribution 3. Maximum possible precipitation 4. Runoff 5. Chikugo River, Japan.**—*Author's abstract.*

9.5–234 551.578.46:551.579.2

Magyar Tudományos Akadémia, Budapest. Agártudományok Osztálya, **A hóolvadás vizsgálatának kérdései.** [Problems of snow melt research (A discussion held at the Hungarian Academy of Science, Class 4, on Nov. 23, 1955)]. Its *Közleményei*, 9(1/3):237–284, **1956.** Includes: **Introductory lecture** by Pál Salamin, p. 237–258. 8 figs., 3 tables, 5 photos, 24 refs. Other communications p. 259–284. 20 tables. **DLC**—In his lecture introducing a discussion on snow melt, SALAMIN reviews Hungarian observation and research activities concerning the various thermal and hydrological elements affecting snow accumulation and melting under the specific climatic, orographic, plant and soil conditions of Hungary. Data obtained in a snow survey in a small drainage area (16.7 sq km) in the Bükk Mountains are presented in charts and graphs, showing meteorological data for Miskolc (Jan. and Feb. 1954), water content and specific weight of snow (Feb. 12–15, and 26–28), and the effects of orientation, elevation and plant cover. Communications of other participants cover the subjects of data requirements (M. KÉRI), above-freezing temperature of air inside the snow cover as a factor affecting snow melt (S. LÁNG, with tables of comparative temperature in and outside snow cover), effect of soil priming on snow melt (I. KULIN), energies involved in the melting of snow, considered on a large scale (D. BERÉNYI), radiation climate as affected by snow cover (Z. DOBOSI), desirable density of sampling sites (Z. SZIGYÁRTÓ), beneficial and harmful effects of snow accumulation from the point of view of plant growth (O. HANK), effect of atmospheric pollution on snow melt (A. ZÁCH), accounting for snow-melt heat in temperature forecasting (N. BACSÓ), relations between the water economies of snow and soil (Z. FEKETE, table) and other problems. *Subject Headings:* **1. Snow melt research 2. Snow surveys 3. Bükk Mountains, Hungary.**—*G.T.*

9.5–235 551.578.46:551.579.2

Salamin, Pál, **A hó olvadásának vizsgálata a Bükk hegységben.** [Investigation of snow melt in the Bukk Mountains.] *Időjárás*, Budapest, 60(5):265–276, Sept./Oct. **1956.** 6 figs., 3 tables, 5 refs., eqs. German summary p. 265. Complete English translation, p. I–IX. **DLC** (QC851.M125, v. 60)—The results of investigations from Jan.–March 1954 on snow melting in this plateau region of Hungary (elevation 600–959 m) are reported in detail, and the methods of measurement and computation are described. Studies were made on the daily depth, volume-weight, and water-content variations of snow; factors affecting melting, such

as exposure, vegetative cover, solar radiation, and rainfall; and the water and thermal balan of the snow cover. The measurements were conducted during a period of snow accumulatio a period of thaw due to solar radiation, and a period in which melting occurred chiefly unc the influence of heat supplied by the air and rainfall. Data are tabulated and graphed meteorological conditions during the period of investigation, snow-cover distribution and wa balance, amount of precipitation, snow-cover depth and volume weights, the water content snow, and water percolation through snow. Formulas used to compute the amount of wa in snow are presented. *Subject Headings:* **1. Snow melt 2. Water content of snow 3. Bü Mountains.**—*SIPRE abstract.*

9.5–236 551.577.21:551.57

*International Boundary and Water Commission (United States and Mexico), **Flow of t Rio Grande and related data from Elephant Butte Dam, New Mexico to the Gulf of Mexi 1953, with maximums, minimums and normals.** Its *Water Bulletin*, No. 23, **1953.** 96 Also **1954.** *Ibid.*, No. 24, **1954.** 102 p. both **DWB** (M79.4 I61w)—Monthly and annu average and 1953 rainfall for over 100 U. S. stations and a similar number of Mexican rainf stations in the Rio Grande Basin are presented on p. 81–85 of the 1953, and p. 87–93 of t 1954, issue. Average rainfall each month and for the year are given for each of 12 subdivisio of the Rio Grande Watershed, with totals and averages for 83 years (1871–1953), as well 1954, on p. 86 and 94, respectively. A list of stations and their locations, periods of reco ets., on p. 87–8, and evaporation data of p. 86–90, temp., humidity and wind on p. 91 and 95 respectively, is given. (Almost entirely tables.) In the 1954 issue, the monthly avera evaporation for 8 stations in the U. S. and 10 stations in Mexico appears on p. 97 and 9 On p. 99 will be found the monthly mean temp., humidity and wind speed for several statio in U. S. and Mexico. *Subject Headings:* **1. Hydrometeorological data 2. Rainfall data f Rio Grande Basin 3. Evaporation data 4. Rio Grande Basin 5. Texas 6. Mexico.**—*M.*

9.5–237 551.579.4:519.24

Matsevichus, I. I. and Poshka, A. L., **K voprosu opredeleniia koeffitsienta reduktsii empiricheskikh formulakh dlia rascheta maskimal'nykh raskhodov.** [Determining the duction coefficient in empirical formulas for calculating maximum discharge.] *Meteorolog i Gidrologiia*, Leningrad, No. 3:43–44, March **1956.** 2 figs., 2 refs., eq. **DWB, DLC**—T coefficient of reduction for spring floods was found to range from 0.11 to 0.15, the correlati between the size of the catchment area and the module of maximum discharge varied betwe 0.44 and 0.56. For small basins ($F < 1000$ km^2) there was no relationship between size catchment area and the modules of maximum discharge, the coefficient of reduction bei close to zero. For large basins ($F > 1000$ km^2) the relationship is more distinct and the coe cient of reduction is 0.28. The coefficient of reductions for torrent and rain floods was 0. and 0.25. It was found that the coefficient of reduction has a zonal character. *Subj Headings:* **1. Maximum river discharges 2. Coefficient of reduction.**—*I.L.D.*

CLIMATOLOGY AND BIOCLIMATOLOGY

CLIMATOLOGY

See also: **Climatic records** (Changnon), 9.5–13; **Centers of action, N. Hemisphere** (Fukuda), 9.5–154.

9.5–238 551.58:51

Serra, Louis, **La représentation des facteurs climatologiques par des courbes d'égal probabilités.** [Presentation of climatic factors by means of equal probability curves.] *Météorologie*, Paris, Ser. 4, No. 45/46:177–183, Jan./June **1957.** 4 figs., 2 eqs. Fren English and German summaries, p. 177. **DWB**—It has long been recognized that the arit metical mean, which is only the summary of a whole series of measurements, is in itself n sufficient to represent all the information. It assumes its full value only if accompanied by dispersion index. Therefore, a means has been found to represent this dispersion ind graphically and in convenient fashion. If we take, for example, as "measurement to

epresented" the precipitation regime of an extended region (the French Alps) during a certain beriod (a month, a season, etc.), we can draw "isolines of probability" which are compared with the conventional "lines of equal proportion to the mean." *Subject Headings:* **1. Statistics in climatology 2. Probability isolines.**—*Author's abstract.*

9.5–239 551.58(47)

Siadek, Bronisław, **Przedmiot i zadania klimatologii w świetle dyskusji w ZSRR.** [Objectives and problems of climatology in the light of discussions in the USSR.] *Przegląd Geograficzny*, Warsaw, 27(1):103–116, **1955.** 25 refs. **DLC**—A review of numerous papers published during the last three years in the journals **Meteorologiia i Gidrologiia** and **Izvestiia Vsesoiuznogo Geograficheskogo Obshchestva,** by such outstanding climatologists as O. A. Drozdov, E. E. Fedorov, K. I. Kashin, B. P. Alisov, Kh. P. Pogosian, A. F. Dubiuk, E. S. Rubinshtein, S. P. Khromov, devoted to the discussion of achievements, mistakes and shortcomings of Soviet climatology and to methods of eliminating these imperfections, and uncovering new ways of developing climatology as a science in order to satisfy more fully the growing demands of national economy. *Subject Headings:* **1. Problems in climatology 2. Climatology of U.S.S.R. 3. Reviews.**—*A.M.P.*

CLIMATIC ZONES

See: **Tropical climate and econ. development** (Lee), 9.5–8; **Seasonal temp. distribution, India** (Jagannathan), 9.5–177.

CLIMATE OF PARTICULAR PLACES

9.5–240 551.582.2/3(711)

*Harry, K. F., **Some aspects of the climatology of the South-Western B. C. coast.** *Canada. Meteorological Div., CIR*-2661, TEC-217, June 2, **1955.** 9 p. 17 figs., 17 refs. **DWB, DLC**—The major features of the climate of the southern part of Vancouver Island and the adjacent mainland (near greater Vancouver, B. C.) are described briefly and illustrated by well chosen charts (showing relief in color) or graphs. Isotherms of mean and extreme, Jan. and July temps. and isohyets, snow depths, total snowfall, snowfall in years of greatest and of least snowfall, etc. are included. Some mention is made in the text of other elements such as glaze, winds, sunshine and fog. The extreme variability in rain and snowfall, both from year to year and in short distances, is vividly illustrated by these charts. Mean annual precip. varies from 20″ to 264″ in about 70 mi. *Subject Headings:* **1. Climate of S.W. British Columbia 2. British Columbia.**—*M.R.*

9.5–241 551.582.2(71)

*Heusser, Calvin J. (*American Geog. Soc., N. Y.*), **Postglacial evironments in the Canadian Rocky Mountains.** *Ecological Monographs*, Durham, N. C., 26(4):263–302, Oct. **1956.** 14 figs., 3 tables, bibliog. **DLC**—This article contains a description of the climate of the Canadian Rockies and presents graphs of ten year running means of mean annual temperature, total annual precipitation and total annual snowfall for Banff and tables with temperature data for selected stations in Alberta and British Columbia. *Subject Headings:* **1. Climate of Canadian Rockies 2. Canadian Rockies 3. Alberta 4. British Columbia.**—*I.L.D.*

CLIMATIC CHANGES

9.5–242 551.583

Megbolondult vagy megváltozott az időjárás? [Has weather turned insane or has it changed?] *Népszabadság*, Budapest, 2(19):6–7, Jan. 23, **1957. DLC**—This newspaper article takes up the problem of climatic changes. It is stated that the annual average temperature has increased by 0.5°C during the last 75 yrs. As possible causes of this warming and of an increase in hurricane and tornado activity during the last 25 years, the following phenomena are discussed: atomic explosions, jet streams, changes in the general circulation, volcanic eruptions and sunspots. The latter three are accepted as partial explanations of weather changes. *Subject Headings:* **1. Climatic variations 2. Hungary.**—*G.T.*

9.5–243 551.583:551.461

Pfannenstiel, Max, **Die Schwankungen des Mittelmeerspiegels als Folge der Eiszeite** [Fluctuations of the level of the Mediterranean Sea as a consequence of the Ice Ages.] *Fr burger Universitätsreden*, n.s., No. 18, pub. Freiburg i. B., Schulz, 1954. 19 p. **DL** (GC651.P45)—In this informal and rather literary address, author summarizes the crite for determining the occurrence of climatically induced variations in sea level, and then descrit the paleography of the Mediterranean lands during the Würm glaciation when the sea lev had fallen about 90 m and during the Riss-Würm interglacial when the sea level of the Me terranean was 15 m above the present level. Also, the accompanying changes in groun water level and river water levels associated with the fall in sea level are discussed brief *Subject Headings:* **1. Climatic changes 2. Sea level changes 3. Ice Ages 4. Mediterrane Sea.**—*I.L.D.*

9.5–244 551.583.15:551.524.35(4

Kolobkov, N. V., **Kontrasty pogody v fevrale.** [Weather contrasts in February.] *P roda*, Moscow, 46(2):124–125, Feb. **1957.** fig. **DLC**—Climatic extremes, experienced ov the Soviet Union and the Near East, are described. Temperature singularities at Mosc are given for February. *Subject Headings:* **1. Climatic extremes 2. Temperature singularit 3. U.S.S.R.**—*A.A.*

9.5–245 551.583

†Huzayyin, Soliman (*Prof. Geog., Cairo Univ., Egypt*), **Changes in climate, vegetatic and human adjustment in the Saharo-Arabian belt with special reference to Africa.** (I International Symposium on Man's Role in Changing the Face of the Earth, Princeton, N. June 1955, [**Proceedings**]. ed. by W. L. Thomas, Jr. Univ. of Chicago Press, **1956.** p. 30 323. Bibliog. p. 321–323.) **DLC** (G56.I63)—This paper contains a discussion of the ge graphical relations of the Sahara-Arabian belt in the Old World, a paleo-geographic surv of the past climate, vegetation and human activity, correlation of changes in climate vegetatio and surface in human times, the pleistocene changes in geographical environment and hum adaptation, climatic changes during historical times, etc. *Subject Headings:* **1. Clima changes 2. Acclimatization 3. Historical climates 4. Sahara-Arabian belt, Africa.**—*I.L.*

MICROCLIMATOLOGY

9.5–246 551.584:581.

Frenyó, Vilmos, **A mikroklíma növényélettani vonatkozásai.** [Phytobiological aspects microclimate.] *Időjárás*, Budapest, 55(3/4):72–78, March/April **1951.** figs., 11 refs. **DLC** Examples are given to show the effect of the microclimatic distribution of various meteo logical elements on plant growth and crops. As an agronomist, the author outlines the typ of micrometeorological surveys from which plant growers would derive the most bene Photographs show different sizes of leaves grown under different microclimatic condition *Subject Heading:* **1. Agricultural microclimatology.**—*G.T.*

9.5–247 551.584

Penzar, Ivo, **Mikroklimatološka istraživanja geofizičkog instituta u kotaru Križevci 19** [Microclimatological investigations of the Geophysical Institute in the vicinity of Križe in 1953.] *Zagreb, Sveučilište. Geofizički Institut, Radovi*, Ser. 3, No. 7, **1956.** 19 p. ma 11 tables, 7 refs. German summary p. 15–19. **DWB**—Micrometeorological measureme of air and soil temperature, atmospheric humidity, wind, cloudiness and evaporation w made from July 24 to Aug. 27, 1953 near Križevci in an area of low hills. Hourly mean valu of the elements measured in different stands (meadows, corn and potato fields, bare grou vineyards and forests) at different locations and orientations are tabulated and discusse The general weather development during the investigation is described. *Subject Headin* **1. Micrometeorological observations 2. Križevci, Yugoslavia.**—*G.T.*

9.5–248 551.584.1

Tretsevekiĭ, I. V., **O vliianii sel'skokhoziaĭstvennykh kul'tur na mikroklimat.** [T influence of agricultural crops on microclimate.] *Meteorologiia i Gidrologiia*, Leningrad, N

:40–42, Jan. **1956.** table. **DWB, DLC**—Observations on the microclimate of agricultural rops, such as rye, winter and summer wheat, maize, sunflower, sugar beet, etc., were carried ut in the Voronezh Oblast. Air temperature, relative humidity and wind velocity were neasured at a height of 15 cm above the soil surface. Data on air temperatures underneath he various crop covers are given. The characteristics of the microclimate during the various tages of plant growth and development are discussed. *Subject Headings:* **1. Crop microlimatology 2. Voronezh Region, U.S.S.R.**—*I.L.D.*

9.5–249 551.584.5:711.4

Paszynski, Janusz, **Zagadnienia klimatyczne w fizjografii urbanistycznej.** [Climatic roblems in urban physiographic studies.] *Przegląd Geograficzny*, Warsaw, 27(3/4):535–545, **955.** fig. Russian and English summaries, p. 544–545. **DWB**—A description is presented f methods used to investigate local climate in connection with town planning activities. his involves an analysis of the general microclimate: the determination of areas with distinct nicroclimatic conditions on the basis of (1) a sufficiently dense network of stations, (2) sysematic measurements of points along characteristic land profiles during various weather onditions, (3) analysis of topographic conditions and (4) possible climatic changes produced y buildings, etc., and improvement of climatic conditions by changing the geographic enironment. *Subject Headings:* **1. Town planning 2. Microclimates.**—*Based on author's bstract, and I.L.D.*

9.5–250 551.584.9:629.113

King, E. (*Tübingen*), **Ein Beitrag zum Raumklima in Kraftfahrzeugen.** [Contribution o the climate of automobiles.] *Wetter und Leben*, Vienna, 8(8/11):213–219, **1956.** 3 figs., refs. **DLC**—The interior climate of automobiles was investigated as a result of statistical lata obtained in Tübingen over the period 1950–1955, indicating that thermal conditions, specially sultriness, is a most important factor associated with automobile accidents. Data howing the variation of temperature within a small, closed, standing black and white sedan rom 7 to 20 o'clock on a sunny Sept. and May day, warming of moving automobile with and ithout ventilation, temperature relationships in the automobile as compared with street and helter temperature, and sultriness in a closed automobile (in degree of sultriness) with an utside temperature of 20–30°C, and a global radiation temperature of 0.70–0.80 bm cal/cm²/ nin are presented. *Subject Heading:* **1. Automobile climates 2. Tübingen, Germany.**—*I.L.D.*

CLIMATIC CLASSIFICATION

9.5–251 551.585:63

Sapozhnikova, S. A., **Problemy agroklimaticheskogo raĭonirovaniia territorii SSSR.** Problems of agroclimatic regionalization in the USSR.] (In: Budyko, M. I. (*ed.*), **A. I. Voeĭkov i sovremennye problemy klimatologii.** Leningrad, **1956.** p. 262–275. 6 figs., 3 tables, 20 refs.) **DWB**—General considerations of the importance of soil climate and of climate on soil fertility and the problem of agroclimatic regionalization are followed by more detailed discussion of the use of various relationships among climatic elements in establishing agroclimatic regions. These include the relationship between air and soil surface temperatures, average dates when a break occurs in spring frosts of various intensities as a function of the average dates of break in frosts during a minimum temperature of 0°C, differences between the hydrothermal coefficient for May and June and Aug. for determining the coefficient for individual parts of the USSR. The importance of a knowledge of the climatic requirements of various crops; local climatic conditions; frequencies of specific climatic variables within limits of crop requirements, the moisture and heat supply for various crops and their requirements, etc. are discussed. Maps showing mean secular supply of heat and moisture for maize, for cultivation, for dry grain, for silos (in percent of optimum), and limits of necessary annual snow accumulation for providing minimum amounts of water to early summer grains are presented. *Subject Headings:* **1. Soil climates 2. Agroclimatic regions 3. U.S.S.R.**—*I.L.D.*

9.5–252 551.585:551.577

Schaufelberger, P. (*Chinchina, Colombia*), **Vierzig Jahre Regenfaktor.** [Forty years of use of the "rain factor."] *Naturforschende Gesellschaft, Zurich, Vierteljahresschrift*, 100(3):194–

201, Sept. 30, 1955. 6 tables, 10 refs. **DWB**—In recognition of the work done by La (1915) in classification of climates according to the "rain factor" and the development of concept by DE MARTONNE, TROLL (LAUER), VILA and others, with special application to tropics and to Colombia in particular, an analysis of Colombian rainfall types and seaso distribution of rainfall according to the various systems is presented with tabular data fo score of stations to support the analysis. TROLL's system is shown to be inapplicable si it shows 12 months as humid and none as arid for Bogotá and many other places which ha a double rainfall maximum. On the other hand, DE MARTONNE's system fails to differenti between places such as Espinal with 740 mm/yr and Andagoya with 7050 mm/yr. Te peratures also vary greatly in the tropics (because of altitude), so any rational classificat must consider temperature and precipitation. The system used by the Colombian Ag cultural Ministry recognizes several temperature and several rainfall classes and descri the climate of each place verbally (e.g., Bogotá cold, dry; Baranquilla hot and very dry; L Vegas mild and very wet, etc.). *Subject Headings:* **1. Climatic classifications 2. Lang's r factor 3. Tropical climates 4. Colombia.**—*M.R.*

9.5–253 551.585.5:551

*†Aref'eva, V. A., **Gidrograficheskaia kharakteristika stepnoĭ zony Volgo-Ural'sk mezhdurech'ia.** [Hydrographic characteristics of the steppe zone of the region between Ural and Volga Rivers.] *Akademiia Nauk SSSR, Institut Geografii, Trudy*, No. 69:93–1 **1956.** 10 figs., 10 tables, 21 refs. **DLC**—This hydrographic study contains a descript of the climate of the Caspian depression. Data on the dates of the passage of air temperat through 0°C and of periods of beginning of positive mean daily temperature at Borisovka a Novouzensk, mean monthly and mean daily amount of precipitation for various localities a snow water reserves for Jan.–April 1951 and 1952 are included. A map showing mean mont water reserves in snow is presented. *Subject Headings:* **1. Hydrography 2. Climate of Casp depression 3. Steppe climates 4. U.S.S.R.**—*I.L.D.*

BIOCLIMATOLOGY

See also: **Int. Journ. of Bioclimat., 9.5–1; Int. Soc. for Bioclimat. and Biomet.** (Langlo), 9.5–35; **Int. Soc. for Bioclimat. and Biomet.** (Undt), 9.5–36.

9.5–254 551.586:612.01

Hamlin, Talbot, **Hot weather comfort.** *Yachting*, N. Y., 100(2):66, 98–100, Aug. 1 illus. **DWB**—Hints for keeping cool on board a yacht during summer, or in the trop *Subject Headings:* **1. Comfort climate 2. Cooling power.**—*M.R.*

9.5–255 551.586:

Reifferscheid, H., **Untersuchungen der Wärmehaltefähigkeit einiger natürlicher künstlicher Faserstoffe.** [Investigations on the heat insulation properties of some nat and artificial fiber fabrics.] *Wetter und Leben*, Vienna, 7(8/11):283–284, **1955.** 3 r **DLC**—The heat conductivity of natural and synthetic fabrics was studied with the aic the Davos frigorimeter. At low wind velocities the heat conductivity of both natural synthetic fabrics is a function of "roughness" which determines the heat transfer from bod surroundings. An equation expressing the heat transfer as a function of wind and nat convection is presented. The different boundary layers in natural and synthetic fibers for as a result of their surface properties. A study of heat losses of different fabrics as a func of wind velocity shows that all curves have slight concave portions in the upper part. lowest point attained varies with the wind velocity. With increasing wind velocity the cu reverse and become convex. A similarity of this behavior to conditions in the layer near ground is indicated. *Subject Headings:* **1. Clothing climate 2. Clothing insulation 3. H capacity of artificial fabrics.**—*I.L.D.*

9.5–256 551.586

Arnóti, Tibor and Kéri, Menyhért, **A melbourne-i olimpia bioklimatikus kérdései.** [climatological problems of the Melbourne Olympics.] *Testneveléstudomány*, Budap

(2):194–197, 1955. 6 figs. **DLC**—Comparative climatological data (temperature, precipitation, humidity, wind, and duration of the seasons) are graphically presented for Budapest and Melbourne. It is found that the difference in the climates of the two cities is not too great in itself, but the change from late fall in Hungary to early summer in Australia will involve serious hardships. *Subject Headings:* **1. Sports activities 2. Sports climatology 3. Olympic games 4. Melbourne, Australia.**—*G.T.*

9.5–257 551.586:796

Arnóti, Tibor and Kéri, Menyhért, **Az időjárás és az éghajlat hatása a sportteljesítményekre.** [Effect of weather and climate on sports achievements.] *Testneveléstudomány*, Budapest, 1(1):100–101, 1955. **DLC**—In Hungary, it is planned to conduct research on the effects of weather and climate on various sports activities. The research will be concerned with the effects of air masses and fronts, and problems of acclimatization in contests abroad. The purpose of the planned studies is to improve the training of contestants by making use of meteorological information. *Subject Headings:* **1. Sports activities 2. Sports climatology.**—*G.T.*

ENVIRONMENTAL INFLUENCES

See also: **Radiation on vertical planes, Belgian Congo** (De Coster, Schuepp), 9.5–166.

9.5–258 551.588.2:551.513.2:551.557.5

Gambo, K. (*Geoph. Inst., Tokyo Univ.*), **The topographical effect upon the jet stream in the westerlies.** *Meteorological Society of Japan, Journal*, Ser. 2, 34(1):24–28, March 1956. 5 figs., 9 refs., eqs. **DWB, DLC**—Reprinted in: *Collected Meteorological Papers*, Tokyo, 5(1/2), Dec. 1955. Contribution No. 87. **MH-BH**—It is the purpose of this paper to make clear the effect of topography upon the jet stream. As the numerical example, the strong jet stream over the Far East is discussed quantitatively in connection with the Himalayas. The fundamental concept we used is that the stationary pattern is obtained if $n+dh$ (n: absolute vorticity, d: constant, h: height of the topography) coincides with the stream function. The difference of roles of topographical effect upon the stationary pattern between the Himalayas and the Rocky Mountains is also discussed. *Subject Headings:* **1. Orographic influence on jet stream 2. Himalayas.**—*Author's abstract.*

9.5–259 551.588.2:551.513

Holzapfel, Rupert, **Zum Einfluss von Gebirgen auf die allgemeine Zirkulation.** [The influence of mountains on the general circulation.] *Germany. Deutscher Wetterdienst, Berichte*, 4(22):140, 1956. 4 refs. **DWB, DLC**—The author points out that an analysis of 5 yrs of comparative aerological data obtained at Berlin and Munich indicates that the Alps and even the Mittelgebirge influence the circulation up to the tropopause. The possibility that the mountain ranges of the Northern Hemisphere play a substantial role in the thermal and dynamic structure of the atmosphere is indicated. The need for a model of the general circulation, taking into account surface relief, is stressed. Radio soundings in the interior of the Alps combined with data from German sources would provide more information regarding the role of mountains in the general circulation. *Subject Headings:* **1. Orographic influences on circulation 2. General circulation 3. Alps.**—*I.L.D.*

9.5–260 551.588.6:551.584.41

Rutkovskaia, V. A., **K voprosu ob uluchshenii vodnogo rezhima rek gornogo Kryma.** [Problem of the improvement of the water regime of the Crimean mountain rivers.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geog.*, No. 2:106–112, 1957. 3 figs., 21 refs. **DWB**—It is shown that an analysis of observational data for a period of many years (1860–1941) of the hydrological, climatic, and counter-erosional significance of mountain forests in the Crimea, confirms, in spite of its incompleteness, the water-regulating, soil-protecting, and microclimatic importance of the Crimean mountain forest belt. *Subject Headings:* **1. Forest influences on water regime 2. Soil erosion 3. Crimea.**—*A.M.P.*

SYNOPTIC CLIMATOLOGY

See also: **Synoptic climat., Central Asia** (Bugaev), 9.5–12; **Airport met. data, Canada,** 9.5–95.

9.5–261 551.58

Berkes, Zoltán, **Egy dinamikus éghajlat-kutató módszer.** [A method of dynamic climat logical research.] *Időjárás*, Budapest, 55(9/10):256–260, Sept./Oct. **1951.** 14 figs., 4 re Russian and French summaries p. 309–310. **DLC**—The author's proposed "differenti climatology" is a method of climatic analysis based on the changes of climatic elements fro one month to the next. Applications of the method are discussed. Maps of Hungary sho temperature, surface pressure, precipitation and wind speed differences from April to Ma May to June and June to July; also differences between temperature and precipitation varia tions from April to May as compared to May–June. All data represent normals for th period 1901–1930. *Subject Headings:* **1. Dynamic climatology 2. Climatic analysis 3. Hun gary.**—*G.T.*

9.5–262 551.589.5:656.7

*Johns, P., **A statistical analysis of bad flying weather at Gander Airport.** *Canada. Me teorological Div., CIR*-2559, TEC-196, Nov. 19, **1954.** 14 p. 38 figs., table, 2 refs. **DWE DLC**—This analysis is aimed at relating low ceilings and visibilities with wind direction a Gander Airport and is based on 9 years of data (Apr. 1942–March 1951). Location, dat sources, topography, causes of poor weather, seasonal variations, monthly conditions an overall analysis for year are discussed in the text. Data for each month are presented in th form of 2 polar diagrams for each month, each season and for the year. One diagram give total number of hours of bad weather for each wind direction (16 points), and the other give the percent of time the wind blows from the direction that the weather was bad. The wors weather comes with NW–NNE and ESE–SE winds, but the largest percentage of the eas winds are accompanied by bad weather. Summer has the least and winter the most ba weather, but when it is bad in summer, it is worse than when it is bad in winter. *Subjec Headings:* **1. Flying weather hazard data 2. Ceiling-visibility-wind data 3. Gander, New foundland.**—*M.R.*

MISCELLANEOUS

SOLAR INFLUENCES

9.5–263 551.590.2

Jones, Harold Spencer (*Astronomer Royal of Great Britain*), **Solar activity and its ter restrial effects.** *Smithsonian Institution, Report*, 1955:227–240, pub. **1956.** fig., 3 photos **DSI**—The author discusses the periodic nature of sunspot occurrence, the characteristics c sunspots including their distribution in the sun, their growth and decay, their magnetic prop erties, the filaments and luminences, magnetic disturbances associated with sunspots, th relationship between the earth's magnetic field and the ionosphere and the sun's daily an seasonal altitude, the solar flares, the characteristics and causes of magnetic storms, etc *Subject Headings:* **1. Solar-terrestrial relationships 2. Sunspots 3. Magnetic storms.**—*I.L.D*

9.5–264 551.590.2

Lorenz, Edward (*M.I.T.*), **An approach to theoretical study of solar-weather relationship** *Colorado University, High Altitude Observatory, Institute for Solar-Terrestrial Research, Technica Report*, No. 1, pub. **1956.** Lecture No. 24:6–7. **DWB** (M09.21 C719n)—Some form o "numerical forecasting equation," electronic computer, and simplified atmospheric model are suggested in this brief discussion. *Subject Headings:* **1. Solar-weather relationship 2. Numerical forecasting.**—*W.N.*

9.5–265 551.590.21:541.1

Piccardi, G. and Becker, U., **Test chimico ed attività solare.** [Chemical test and sola activity.] *Geofisica e Meteorologia*, Genoa, 4(4/5):103–104, July/Oct. **1956.** 2 figs., bibliog **DWB**—Most recent data confirm earlier measurements reported in *Geofis. e Met.* (*see* 6.5–171 6.6–211, 7.3–277, 7.5–235 and 8.4–90, *MAB*) showing a correlation between solar activity an

smuth oxychloride precipitation. Tests have now been conducted for 5 yrs. *Subject eadings:* **1. Solar influence on precipitation of chemicals 2. Bismuth oxychloride precipitaon.**—*G.T.*

9.5–266 551.590.24:551.510.535

Hennessey, J. J. and Torres, J. S. (*both, Ionospheric Station, Manila Obs., Baguio City*), **xperimental ionospheric observations of the solar eclipse of June 20, 1955 at Baguio City, hilippine Islands.** (In: **Solar eclipses and the ionosphere: a symposium** . . . ed. by W. J. G. eynon, **1956.** p. 65–68. 3 figs., 2 refs.) **DWB**—Studies of parameters for all the chief nospheric layers are given for the eclipse of June 20, 1955 in the Philippine Islands, which eached its maximum phase (96 per cent obscuration) near noon. Values of f_{min} showed ronounced maxima before the first contact and after the last contact. Stratification of the layer was observed on the control days as well as on the eclipse day, and an intermediate yer between the F1 and F2 layers formed in the second half of the eclipse. There was no ertain evidence of a corpuscular eclipse. *Subject Headings:* **1. Eclipse effects on ionosphere . Solar eclipse, June 1955 3. Philippine Islands.**—*Authors' abstract.*

VISIBILITY

9.5–267 551.591:629.13

U. S. Weather Bureau, **Tips on weather for VFR flight.** Its *Aviation Series*, No. 12, **1955.** p. 6 figs. (incl. photos). Price: $.05. Originally issued as Map-back article, or its *Daily Weather Map*, Oct. 5, **1955. DWB**—When flying by visual reference, pilots require a visible orizon which may be the natural horizon, or the effective horizon determined by existing eather conditions. This better flying horizon is reduced either by dust or smoke, or particles f moisture forming haze, fog, clouds or combinations of those. The height of clouds, and mportance of other impediments such as drizzle of rain, snow, fog, etc., obstructing air-to-round visibility, which are of prime importance to safe VFR (visual flight rules) operation, re discussed and their effect is explained. *Subject Headings:* **1. Aeronautical meteorology . Visual flight rules (VFR).**—*A.M.P.*

OPTICAL PHENOMENA

See also: **Atmos. phenomena** (Novikova), 9.5–9; **Optical phenomena** (Visser), 9.5–10; **Scattering by aerosols** (Fishman), 9.5–48.

9.5–268 551.593:551.551

Gardiner, A. J.; Gifford, Jr., F.; Mitchell, R. I. et al., **Optical studies of atmospheric urbulence.** Flagstaff, Arizona. Lowell Observatory, Contract AF 19(604)-953, Final Report, **1956.** 53 p. 14 figs., 2 tables, 8 eqs.—Studies reported in this monograph based on work done at or near Flagstaff, Ariz., include scintillation studies of double stars and balloon borne lights, relation of scintillation to seeing, adaptation and use of an Excursion Camera; relation of tropopause and atmospheric stability, studies of temp., turbulence and wind vs. seeing, etc. Scintillation was found to be generated at >20,000 ft elevation and sometimes at 100,000 ft for 1–10 cycle and at 10,000–40,000 ft for 150 cycle scintillation. Image motion (excursion) was found to be due to conditions near the ground and very near or even in the telescope. Disturbances were found to have wave lengths of 6–8 in. *Subject Headings:* **1. Scintillation 2. Astronomical observing conditions 3. Turbulence and astronomical seeing 4. Atmospheric optics 5. Flagstaff, Ariz. I. Giclas, H. L. II. Johnson, H. L. III. Wilson, A. G.**—*M.R.*

9.5–269 551.593.63:779

Kusin, G. E., **Snimok galo.** [Photograph of a halo.] *Priroda*, Moscow, 46(1):116, Jan. **1957.** fig. **DWB, DLC**—Photographic data are given for a halo picture taken on Dec. 10, 1955, in Moscow. *Subject Headings:* **1. Halo photographs 2. Moscow, U.S.S.R.**—*A.A.*

9.5–270 551.593.12:551.524

†Iudalevich, F. F., **Nekotorye voprosy, sviazannye s interpretatsieĭ iavleniia mertsani zvezd.** [Some questions connected with the interpretation of the scintillation of stars *Akademiia Nauk SSSR, Doklady*, 106(3):441–444, Jan. 21, **1956.** figs., 16 refs., 11 eq **DLC**—The author examines the possibility of evaluating numerically the mean fluctuation temperature in the turbulent atmosphere on the basis of the phenomenon of stellar scintillatio The equation formula for expressing the mean square fluctuation of intensity is derived a calculated values correspond to directly measured values. *Subject Headings:* **1. Scintillatio 2. Temperature fluctuations.**—*I.L.D.*

ELECTRICAL PHENOMENA

See also: **Ion recombination processes** (Sayers), 9.5–141.

9.5–271 551.594:629.

Imianitov, I. M. and Kolokolov, V. P., **Issledovaniia raspredeleniia indutsirovannogo sobstvennogo elektricheskogo zariada na poverkhnosti samoleta.** [Investigations of th distribution of an induced and inherent electrical charge on the surface of an airplane.] *Leni grad. Glavnaia Geofizicheskiia Observatoriia, Trudy*, 58(120):7–16, **1956.** 3 refs., tabl 6 figs. **DLC**—The purpose of this paper is to determine the position of apparatus and th necessary calculation coefficients in investigations of electric charges in the free atmosphe with the aid of aircraft and for investigating the charges of the latter and to explain the cond tions associated with corona formations under the influence of electric fields and as a resu of the inherent charge of the aircraft. Equations are developed for measuring the inhere and the distribution of the inherent and induced charge on the surface of an aircraft and da on the distribution of charges on the surface of an aircraft are presented both numerically an graphically. The data include the following: distribution of the inherent charge on th surface of an aircraft, distribution of the induced charge in the vertical field, distribution of th induced charge on the surface in the horizontal field, directed along the fuselage and along th wings. *Subject Heading:* **1. Electrical charges on aircraft.**—*I.L.D.*

9.5–272 551.59

Israël, H. (*Meteorologisches Obs., Aachen, Germany*), **Synoptical researches on atmospher electricity.** *U. S. Air Force. Cambridge Research Center, Geophysical Research Paper* No. 42:11–20, Nov. **1955.** 8 figs., 13 refs. **DLC**—Our views on atmospheric-electric ph nomena and their causes have undergone considerable changes in recent years. This particularly true with regard to the clarification of meteorological influences on atmospher electricity. Every weather phenomenon involves meteorological processes which have elec trical effects. Partly these processes act as "generators" producing atmospheric-electr conditions; partly their activity as "variable circuit elements" influences the electrical stat of the atmosphere. This close relation between meteorology and atmospheric electricity correctly recognized today, suggests the widening of work in the field of atmospheric electricit towards synoptic research. Two meteorological-electrical steering processes exist: th "thunderstorm regulation" of world-wide scope, and the more local "weather regulation. Correspondingly, one may distinguish between a "large scale air-electric synopsis" and "small scale" one. By way of a few examples, our present experience with air-electric synopsis as well as its capabilities are discussed. Some thoughts are brought up for discussio concerning the further development of the synoptic approach in atmospheric electricity *Subject Headings:* **1. Atmospheric electricity 2. Weather-atmospheric electricity relationship 3. Synoptic analysis.**—*Author's abstract.*

9.5–273 551.594.2

Imianitov, I. M., **K voprosu ob elektrizatsii i provodimosti grozovykh oblakov.** [Th electrification and conductivity of storm clouds.] *Akademiia Nauk SSSR, Doklady*, 109(1) 77–79, July/Aug. **1956.** 3 figs., 7 refs., eq. **DLC**—The author presents experimental dat showing that conductivity in thunderstorm clouds plays a fundamental role in the formatio of a lightning channel of required charge and that the generation of charges in clouds is mos

probably the result of those elementary processes of electrification which depend upon the potential gradient of the field since the growth of charges in clouds has an exponential relationship to time. The variations in the potential gradient of the electric field during lightning strokes close to thunderstorm clouds were measured from an airplane to exclude the influence of the earth's surface. The variations in electric field were measured with an electrostatic field meter with an inertia of about 0.04 sec. The data are presented in graphical form. *Subject Headings:* **1. Thundercloud electrification 2. Electrical conductivity in clouds.**—*I.L.D.*

9.5–274 551.594.21

Muchnik, V. M. and Shmukler, A. Kh., **K teorii grozy Vorkmena-Reĭnol'dsa.** [Thunderstorm theory of Workman and Reynolds.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, No. 1:112–113, **1956.** 6 refs., eq. **DLC**—The author maintains that the elementary processes of electrification observed during the freezing of weak solutions cannot provide the electrification necessary in the generation of thunderstorm clouds, so that the Workman-Reynolds theory of thunderstorm formation is inadequate. In addition, it fails to explain the positive electrically charged area frequently observed in the lower part of a thunderstorm cloud. *Subject Headings:* **1. Thundercloud electrification 2. Workman-Reynolds thunderstorm theory.**—*I.L.D.*

9.5–275 551.594.21

Hill, E. L. (*Minnesota Univ., Minneapolis*), **Electromagnetic radiation from lightning strokes.** *Franklin Institute of Philadelphia, Journal*, 263(2):107–119, Feb. **1957.** 3 figs., 9 refs., 38 eqs. **DLC**—A theory is given of the spectral distribution and the absolute amount of low frequency electromagnetic radiation emitted from a vertical lightning stroke from cloud to ground. The calculation depends on an assumed physical mechanism for the flow of charge on the discharge channel, but the model corresponds closely to the empirical observations of SCHONLAND, PIERCE and others. The radiated energy has a maximum intensity at about 11 kc/sec and a total width at half-maximum of 12 kc/sec. The predicted radiation in the megacycle region agrees reasonably well with that reported by Chandrasekhar Aiya, although the present theory was developed primarily for the low frequency region. The total energy radiated in one leader and return stroke is estimated to be about 220,000 joules. *Subject Heading:* **1. Lightning radiation.**—*Author's abstract.*

9.5–276 551.556:551.594.222:629.13

Chapman, Seville (*Cornell Aeron. Lab., Inc., Buffalo, N. Y.*), **Effects of wind and space charge on corona point discharge, particularly from aircraft.** *U. S. Air Force Cambridge Research Center, Geophysical Research Papers*, No. 42:120–134, Nov. **1955.** 3 figs., table, 8 refs., 62 eqs. **DLC**—This is a condensed version of a paper by the same title presented at the Conference and published as *Cornell Aeronautical Lab. Report* No. 66; Contract AF 19(122)-475, Report No. RA-766-P-11, Oct. 31, **1954.** (*See* 7.2–185 in Feb. 1956 *MAB* for abstract.) *Subject Headings:* **1. Corona discharges from aircraft 2. Wind effects on corona discharges.**—*M.R.*

9.5–277 621.317:551.594.25

Kolokolov, V. P. and Ogorodnov, D. E., **Primenenie pribora napriazhennosti polia dlia izmereniia toka osadkov.** [Use of field-strength apparatus for measuring the electric current of precipitation.] *Leningrad. Glavnaia Geofizicheskaia Observatoriia, Trudy*, 58(120):17–22, **1956.** 3 tables, 2 refs., 3 figs., 5 eqs. **DLC**—With the aid of diagrams and a photograph, the author describes a device, termed a dynamic electrometer, for measuring the electric charge brought by precipitation to the earth's surface. In principle, it consists of a flat measuring plate connected by a resistance to the earth. By means of a grounded rotating screen, the plate can be alternatingly either exposed to or shielded from the electric field. Depending upon the resistance, a current flows proportional to the electric field strength. The voltage obtained from the resistance is intensified and rectified and is then measured. The construction of the apparatus and the relevant equations and results of measurements are presented. *Subject Headings:* **1. Electrometers 2. Electricity of precipitation.**—*I.L.D.*

AURORAS

9.5–278 551.594.5:551.510

Rybner, Jorgen and Ungstrup, Emil, **L'influence de la zone d'aurores boréales sur liaisons radioélectriques.** [Effect of the auroral zone on radio communication.] *Annales des Télécommunications*, Paris, 12(5):172–173, May **1957.** fig., 3 refs. **DLC**—Studies high-frequency propagation between Denmark and western Greenland are reported. Considering all possible modes of propagation, it is found that the unusually weak field intensit observed may be attributed to D-layer absorption in the auroral zone. *Subject Headi* **1. Auroral effects on radio propagation.**—*G.T.*

9.5–279 551.594.51:551.508

†Saskatchewan. Univ. Physics Dept., **Auroral research.** Contract AF 19(122)-1 Final Report, Aug. 15, **1956.** 34 p.—Report contains a list and abstracts of 38 articles reports published under this contract in the field of auroral spectrometry, laboratory studies auroral type emissions, auroral height measurements, sodium D-line (twilight) spectromet and related subjects, plus an account of progress during the first half of 1956 in these field Equipment development includes a 9-inch and a 5-inch auroral spectrograph for use at t Univ. of Saskatchewan, Physics Building; an infrared spectrometer (6000Å to 20,000Å a patrol spectrograph for use over a wide portion of the spectrum and now being adapted f automatic recording; an auroral and night sky exposure register; a scanning spectrometer, e *Subject Headings:* **1. Auroral physics research 2. Auroral spectrometry 3. Auroral instr ments 4. Saskatoon, Saskatchewan. I. Hunten, D. M. II. Jones, A. Vallance III. Curr B. W.**—*M.R.*

SFERICS AND RADIO METEOROLOGY

See also: **Ionospheric reflection coefficients** (Pillet), 9.5–139; **Auroral effects on radio propagation** (Rybner, Ungstrup), 9.5–278.

9.5–280 551.594.6:551.508.

Grierson, J. Kenneth (*Defence Research Board, Ottawa*), **A technique for the rapid analys of whistlers.** *Institute of Radio Engineers, N. Y., Proceedings*, 45(6):806–811, June **195** 2 figs., 13 foot-refs. **DLC**—This paper discusses the design of a new type of sound spectrograp intended for analyzing whistlers. This instrument is of the single-channel scanning type, b its basic action is to scan the frequency-time plane in frequency at a fixed time rather tha as in existing instruments, in time at a fixed frequency. The principle is as follows: Firs a very short section of the signal to be analyzed (roughly equal in duration to the reciproc of the bandwidth of the analyzing filter) is stored in the instrument electronically. T stored signal is then read out repeatedly many times faster than its original speed, and th repeated wave form is analyzed by a variable-tuned filter which sweeps once very rapid through the expanded frequency band which the signal now occupies. The varying outp from the filter, representing the variations of the amplitude of the signal with frequency at o particular time, is recorded as one line of a scan across a continuous strip display. Finall the stored sample of signal is erased, replaced with the next sample, and the whole proce repeated. An audio frequency spectrograph of this type appears to combine speed of operatio with fine resolution in frequency, rendering it useful for the rapid analysis of whistlers. *Subje Headings:* **1. Sound spectrograph 2. Whistler recorders 3. Whistler analysis.**—*Author abstract.*

9.5–281 551.594.6:551.508.

Helliwell, R. A. (*Stanford Univ., Calif.*) and Morgan, M. G. (*Dartmouth College, N Hamp.*), **IGY whistler observations.** *Science*, Wash., D. C., 123(3201):788, May 4, 195 **DLC**—Notes on the program of synoptic observation of whistlers in the Northern and Souther Hemispheres, respectively, as outlined at the Boulder, Colo. meeting Feb. 14–16, 1956 for th IGY, 1957/8. Whistlers are thought to be signals from lightning discharges that follo longitudinal lines of magnetic force and where the high frequencies arrive ahead of the lo producing a descending note or whistle. They are believed to follow a path 2 or 3 earth rad

it in space, so would give indications of ionization at very high altitudes. Stations proposed le listed in 3 groups: The Atlantic, Pacific, and Mid-Continent Group. *Subject Headings:* **Whistler stations 2. IGY whistler program.**—*M.R.*

ACOUSTICAL PHENOMENA

See also: **Sound intensity measurement** (Pardue, Hedrich), 9.5–113.

9.5–282 551.596

Tonning, Andreas (*Norwegian Defence Res. Estab., Bergen*), **Scattering of electromagnetic aves by an acoustic disturbance in the atmosphere.** *Applied Scientific Research, Sec. B,* 6):401–421, **1957.** 6 figs., 3 refs., eqs. **DLC**—The variations in density associated with n acoustic wave are shown to influence the propagation of an electromagnetic wave. The ariation in electric permittivity of the atmosphere, caused by an acoustic wave, is expressed y the power density of the wave. Under the assumption that the acoustic waves are spherical, he scattered field at large distances is given in terms of definite integrals which are evaluated y means of the method of Stationary Phase. The limiting case of plane acoustic waves is scussed, and two numerical examples are given. *Subject Headings:* **1. Acoustical waves Scatter propagation.**—*Author's abstract.*

9.5–283 551.596.1

Scheid, Georg, **Untersuchungen über die Schallausbreitung auf nahe Entfernungen.** [Investigations of sound propagation over short distances.] *Germany. Deutscher Wetterdienst, erichte,* 4(25), **1956.** 16 p. 13 figs., 3 tables, 26 refs. **DWB, DLC**—The first part of this udy is a review of the most important studies of anomalous sound propagation over short listances, beginning with the investigations of R. Ladenburg and F. Von Angerer in 1913 n sound propagation in the free atmosphere. In Pt. 2 the author extends the characteristic ound propagation curves of Kölzer to heights of 1500 m. It is shown that the resumption f the increase of sound velocity above the values at ground level is characteristic of anomalous ounds. The partial and complete return of the echo produced by the maximum velocity f the sound aloft is used to provide an explanation of the zone of anomalous audibility, in ood agreement with the recordings. The increase in amplitude observed in the inner zone f second audibility is explained. *Subject Headings:* **1. Anomalous sound propagation . Sound velocity.**—*Trans. of author's abstract, I.L.D.*

PART II. RECENT LITERATURE ON PHYSICO-CHEMICA OCEANOGRAPHY

Compiled by: *Mary L. Rice*

INTRODUCTION

The emphasis in this compilation has been on the physico-chemical properties (temperatu optics, radiative properties, acoustics, suspended material, salinity, etc.) of sea water. So general works are included as well as papers dealing with oceanographic cruises and surveys.

In the April 1958 issue of *Meteorological Abstracts and Bibliography* we published the bulk material in our files on waves, currents and tides.

This is not a systematic bibliography but, together with items in the outline taken from previ issues, is representative of recently published literature in this field.

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1935

9E–1 551.521.14:551.463(45

*Vercelli, Francesco, **Le recenti misure subacquee di radiazione solare nel mare di Capri.** [R cent underwater measurement of solar radiation in the sea at Capri.] *Societa Italiana per il Pr gresso delle Scienze, Napoli, Oct. 11–17, 1934, Atti*, vol. 2:110–128, pub. **1935.** tables, figs. **DL** Also issued as *Trieste. Instituto Geofisico, Pubblicazioni*, no. 83. **DWB**—Theory and experiment data obtained near Capri are discussed and some of the data presented in tables and on a chart fro 0–700 m depth for wave lengths 3600–7500 Å (intensity of illumination with depth). Coefficie of diffusion 1–300 m depth, and albedo of surface *vs* wave length are also tabulated. *Subject Hea ings:* **1. Submarine illumination 2. Albedo of sea surface 3. Capri, Italy.**—*M.R.*

1943–1944

9E–2 551.465(261

*Jacobsen, J. P., **The Atlantic current through the Faroe-Shetland Channel and its influen on the hydrographical conditions in the northern part of the North Sea, the Norwegian Sea, and t Barents Sea.** *International Council for the Exploration of the Sea, Rapports et Procès-Verbaux Réunions*, 112:5–47, Feb. **1943.** 29 figs., 17 tables (some fold.), foot refs. **DWB**—Average thre monthly cross sections of temperature and salinity are given for two profiles between the Far and Shetland Islands, computing also the intensity of total flow. Average three-monthly a annual maps of the equivalent thickness of Atlantic water from Scotland and Iceland up to Spi bergen and the meridian 40°E show that practically all Atlantic water comes through the discuss cross section. Furthermore, the vertical distribution of Atlantic water and intensity of flow discussed for five additional profiles off the coast of Norway. *Subject Headings:* **1. Atlantic Curre 2. Temperature-salinity cross sections 3. Norwegian Sea 4. North Sea 5. Barents Sea.**—*A.A.*

9E–3 551.582.3(26

Japan. Hydrographic Department, **Hoppo-Kaimen Heiyo Kisho-Zu.** [Strategic meteor logical atlas of northern parts of the North Pacific.] **1943.** 175 plates, 2 charts of localities, wi list of the meteorological characteristics at strategic localities. **DLC** (Orientalia, Japanese, Uncat.) Plates 1–12, Monthly charts of wind roses over the North Pacific, from 40°N to 55°N, for 5° squa of latitude and longitude, with inset charts of prevailing winds. Plates 13–24 give monthly h tograms showing winds of various Beaufort force (0∼3, 4∼5, 6∼7, 8∼ in Beaufort scale) over t North Pacific with inset charts showing frequencies of strong gales (more than 7). Plates 25– give monthly charts for the tracks of well-developed cyclones. Plates 37–48 give monthly histogra showing swell of various degrees divided according to frequencies of winds of various Beauf wind forces. Plates 49–60 give monthly histograms showing wind forces of various Beaufort wi forces divided according to frequencies of weather of various types. Plates 61–72 give mont wind roses divided according to frequency of various types of weather. Plates 73–84 give mont histograms showing the weather of various types. Plate 85 gives annual change of precipitati Plate 86, Annual change of the monthly number of days of precipitation and of the monthly numb of days of snowfall. Plate 87, Monthly charts showing the distribution of the amount of precipi tion. Plate 88, Annual change of monthly number of days of fine weather and overcast. Plate Annual change of monthly mean cloudiness and of monthly number of days of fog. Plates 90–1 Monthly histograms showing ceiling during overcast weather. Plates 102–113, Monthly histogra showing visibility of various scales at 0600, 1200, 1800, and 2400 (local time) with inset cha showing frequency of visibility. Plates 114–125, Monthly charts showing the frequency of obser tions when a seaplane can or cannot land on the respective 5° square, including the boundaries of Plates 126 173, Monthly charts showing the Baillie type of upper air wind roses at 1000 m, 2000 and 3000 m level in Okhotsk Sea and Kurile Island area, and the upper air wind roses at 15 select stations in the same area. Plate 174, Monthly charts showing the distribution of barometric pr sure. Plate 175, Annual change of air temperature. *Subject Headings:* **1. Climatic atlases 2. No Pacific.**—*H. Arakawa.*

9E–4 551.582.3(2

Japan. Hydrographic Dept., **Toho-Kaimen Heiyo Kisho-Zu.** [Strategic meteorological at over the Eastern Pacific Ocean.] **1944.** 157 plates. In Japanese. **DLC** (Orientalia, Japan

ncat.)—Contents: Plate 1, gives general characteristics of the meteorological conditions over the orth Pacific from the equator to 60°N and from the coast of America to 180° long., in tabular form. late 2, List of names of localities. Plates 3–4, List of the meteorological characteristics at strategic calities. Plate 5, List of local peculiar winds along the west coast of America. Plates 6–17, lonthly charts showing the Baillie type wind roses over the North Pacific, from the equator to 60°N nd from the coast of America to 180° long. on the respective 5° squares of lat. and long., with set charts showing prevailing winds and average wind force. Plates 18–29, Monthly histogram owing the wind force in Beaufort scale on the respective 5° square with inset charts showing the vere gale (stronger than 7 in the Beaufort scale) frequency. Plates 30–41, Monthly charts for he tracks of well-developed cyclones. Plates 42–53, Monthly histograms showing swell of various egrees, divided according to frequencies of winds of various Beaufort wind forces. Plates 54–65, lonthly histograms showing wind forces of various Beaufort wind forces, divided according to equencies of weather of various types. Plates 66–77, Monthly wind roses divided according to equencies of weather of various types. Plates 78–89, Monthly histograms showing the weather various types. Plate 90, Annual change of precipitation. Plate 91, Annual change of the monthly umber of days of precipitation and of the monthly number of days of snowfall. Plate 92, Monthly harts showing the distribution of the amount of precipitation. Plate 93, Annual change of monthly umber of days of fine weather and overcast. Plate 94, Annual change of monthly mean cloudiness nd of monthly number of days of fog. Plates 95–106, Monthly histograms showing ceiling during vercast weather. Plates 107–118, Monthly histograms showing visibility of various scales at 500, 1200, 1800 and 2400 (local time), with inset charts showing frequency of excellent visibility. lates 119–130, Monthly charts showing the frequency of observations when a seaplane can or annot land on the respective 5° square, including the boundaries of ice. Plates 131–154, Monthly harts showing the upper air wind roses at 0 m∼1500 m and 2000 m∼5000 m level. Plate 155, nnual course of air temperature. Plate 157, Annual course of the possible duration of sunshine. *ubject Headings:* **1. Climatic atlases 2. Eastern Pacific.**—*H. Arakawa.*

1947–1949

9E–5 532.595:551.46

Sukharevskiĭ, Iu. M., **Reverberatsiia moria pri nalichii pogloshcheniia zvuka.** [Reverberation the sea during absorption of sound.] *Akademiia Nauk SSSR, Doklady, Novaia Seriia,* 3(2):229–232, Oct. **1947.** 7 refs., 7 eqs. **DLC**—Development of mathematical theory of absorption and dispersion of sound waves due to compression of air bubbles (Pfriem, H.—1940). *Subject eadings:* **1. Submarine acoustics 2. Reverberations in the sea. I. Pfriem, H.**—*M.R.*

9E–6 551.464(268)

Lobza, P. G., **Khimiko-geograficheskaia kharakteristika shel'fovykh moreĭ Severnogo Ledotogo Okeana v sviazi s dinamikoi ikh vod.** [Chemical and geographic characteristics of shelf seas the Arctic Ocean in connection with the dynamics of their waters.] *Vsesoiuznyĭ Geograficheskiĭ ʼezd, 2nd, Leningrad, 1947, Trudy,* 2:339–340, **1948. DLC**—The chemical properties of waters ver large extents of Arctic shelf seas are considerably changed, as compared with ocean waters, by he influence of the continental runoff. Owing to this, the distribution of some chemical components becomes an excellent indicator for determining waters of different origin and displacement Ob'-Enseĭ river waters can be clearly distinguished in the Kara Sea, etc.). Especially important anges of the chemistry occur in deep waters in regions where stratification is clearly expressed. his makes it possible to follow, by the content of (separate) individual chemical components ctive reactions pH, oxygen, phosphates, etc.), the spreading of deep-sea waters and to get an lea of their dynamics, even in cases when salinity, temperature or instrumental measurements of rrents do not provide sufficiently clear indications. Chemical indicators separate clearly cut rrents of oceanic origin on the Asiatic shelf (in Kara, Leptev, East-Siberian and Chuckchee Seas), flect the expansion of ice and the biochemic processes occurring in shelf seas, and establish the iological productivity of these seas (resources of biogenic elements, the photosynthesis zones and the uration of these processes). *Subject Headings:* **1. Oceanographic chemistry 2. Chemical content seas 3. Ocean current dynamics 4. Arctic Ocean.**—*A.M.P.*

9E–7 551.463

*Abe, Tomosaburo (*Met. Res. Inst. of Japan*), **Study of the foaming of sea water, 9th Report, n the distribution of the size of bubbles in foam layer of sea water.** *Japan. Central Meteorological bservatory, Oceanographical Report,* 3(4):243–249, Dec. **1949.** 4 figs., 3 tables, 2 refs. In Japanese; nglish summary p. 243. **DWB**—The author discusses the frequency distribution of the size of ubbles in foam layer of sea water from the standpoint of statistical mechanics, and obtained the llowing result: the theoretical values of the frequencies calculated by statistical methods agreed irly well with those derived from experimental data; thus it appears that it is possible to deal with

the phenomena relating to foaming by means of statistical mechanics of mathematical probabili (For other papers, *see* 6.11–61, Nov. 1955, 7.9–49 and 7.10–206, Sept. and Oct. 1956, *MAB.*) *Subj Headings:* **1. Foam layer of sea water 2. Statistical analysis.**—*Author's abstract.*

9E–8 5511

Shuleĭkin, Vasiliĭ Vladimirovich, **Essays on the physics of the sea.** Moscow, Publishing Ho of the Academy of Sciences U.S.S.R., **1949.** 354 p. Reproduction of typescript. **DWB.** Tra lation from his original Russian, **Ocherki po fizike moria.** pub. Moscow, Akademiia Nauk SSS **1949.** 334 p. 190 figs. **DLC**—A rough translation of SHULEĬKIN's excellent popular edition his **Physics of the sea,** but without the rich illustrative material which makes the original so prese able. The history of Russian oceanographic research and expeditions is covered fully from I MONOSOV to the present. Other chapters cover, in a unique way, the heat balance of the ocea the continental-oceanic interaction, the currents, waves and surf, the tides and seiches, the cc of the sea, undersea illumination, sounds in and over the sea, and finally the hydrodynamics of fi eels, etc. The book is not lacking in technical information, and of course is based on a wealthi practical as well as theoretical experience. (For abstract of original Russian, *see* 8–148, Aug. 19 and 5A–45, Jan. 1954, *MAB.*) *Subject Headings:* **1. Physical oceanography 2. Translati 3. U.S.S.R.**—*M.R.*

1950

9E–9 551.4

Joseph, Joachim, **Untersuchungen über Ober- und Unterlichtmessungen im Meere und ü ihren Zusammenhang mit Durchsichtigkeitsmessungen.** [Investigations into the measureme of the downward and upward components of submarine illumination and into their relation transparency measurements.] *Deutsche Hydrographische Zeitschrift,* 3(5/6):324–335, **1950.** 5 fi 4 tables, 11 refs., 19 eqs. German and English summaries. **DWB**—On the basis of theoreti considerations of the penetration and extinction of light in water and turbid media, the aut develops formulas representing the intensity distribution of the monochromatic downward a upward component of submarine light in deep and shallow sea areas. Formulas and diagra for determining the extinction, diffuse reflexion, absorption, forward and backward scattering light in water are given. Data on extinction, scattering and reflexion obtained experimentally a tank and by observations in the Western Baltic are given; theoretical and actual measureme are compared. *Subject Headings:* **1. Physical oceanography 2. Submarine illumination.**—*I.L.D.*

1951

9E–10 551.465:551.4

Arons, Arnold B. and Stommel, Henry, **A mixing-length theory of tidal flushing.** *Ameri Geophysical Union, Transactions,* 32(3):419–421, June **1951.** fig., 2 refs., 11 eqs. **DWB**—T salinity distribution in an idealized estuary, where mixing is predominantly due to tides, is comput using an eddy diffusivity based on the distribution of tidal currents and excursions. Compari is made to the salinity distribution in real estuaries. *Subject Headings:* **1. Salinity 2. Eddy fusivity 3. Tides 4. Estuaries.**—*Authors' abstract.*

9E–11 551.464:546.

Buch, Kurt, **Das Kohlensäure-Gleichgewichtssystem im Meerwasser. Kritische Durchsi und Neuberechnungen der Konstituenten.** [The carbon-dioxide stability system in the s water.] *Finland. Merentutkimuslaitos, Julkaisu,* No. 151, **1951.** 18 p. 6 tables, 8 refs. German. **DWB**—Equations for the calculation of the different constituents of carbon dioxid sea-water, with the aid of experimental determination of *pH* and the titration alkalinity, previou given by the author. Other investigations are examined anew and the constant slightly chang Practical tables are added. The proposed method is not applicable for water near the coast, wh the carbon dioxide content must be determined directly. *Subject Headings:* **1. Sea water composit 2. Carbon dioxide.**—*A.A.*

9E–12 551.46(

†Carson, Rachel L., **The sea around us.** Drawings by Katherine L. Howe. N. Y. Oxford U Press, **1951.** 230 p. bibliog. p. 216–220. **DLC**—Popular science book on origin of sea, surf and seasonal variations, depths of ocean, submarine mountains, glaciation, wind and waves, curre solar effects, coriolis effects, tides, regulation of climate by sea, utilization of sea salts, plus a b ography of standard works and a good index. This book was a "best seller." *Subject Headi* **1. Popular oceanography 2. Oceanography textbooks.**—*M.R.*

9E–13 551.463(72)(266)

Dawson, E. Yale (*U. S. C., Los Angeles*), **A further study of upwelling and associated vegetation ong Pacific Baja California, Mexico.** *Journal of Marine Research*, 10(1):39–58, **1951.** 6 figs., able, 7 refs. **DWB**—In order to determine the extent and local or seasonal distribution of up- elling along the coast of Lower California, many temperature soundings were made to 200 ft epth, and the marine flora was studied as an indicator of the prevalence of cold bottom waters t or near the surface. Results of temperature transection on April 24–May 1, 1950 are given raphically and discussed in detail. A catalog of marine vegetation species is given *in extenso* and iscussed by sub-regions. Finally, the local pattern of upwelling is outlined. *Subject Headings:* **. Upwelling 2. Ocean temperature soundings 3. Marine flora 4. Baja California 5. Pacific oast, Mexico.**—*M.R.*

9E–14 551.463(26.04)

Jerlov, N. G., **Optical measurement of particle distribution in the sea.** *Tellus*, 3(3):122–128, ug. **1951.** 3 figs., 6 tables, 15 refs. **DLC**—The measurement of particle content in sea water is ccomplished by measuring the intensity of light from a Tyndall beam. The measuring device, the yndall meter, is a modified Zeiss turbidity meter. The apparatus is described with the aid of a iagram and the procedure is outlined. The use of this method is illustrated by its application to easuring the particle distribution in a vertical section off the Nile estuary and of the distribution f particles and salinity in a vertical section through the Strait of Gibraltar. *Subject Headings:* **. Turbidity of sea water 2. Turbidity meters 3. Salinity 4. Nile River, Egypt 5. Strait of ibraltar.**—*I.L.D.*

9E–15 551.464

*Legendre, R., **Les éléments chimiques de l'eau de mer.** [Chemical elements of sea water.] *cientia*, Milan, 86(672/673):221–227, **1951.** table, refs. **DLC**—A list of elements dissolved in a water, more than half of all known elements, is given in a table claimed to be based on all analyses itherto effected. Possibilities of calculating age of oceans from elements supplied by rivers, and rospects of maritime mineral exploitation are considered and relevant tables presented. *Subject eadings:* **1. Sea water analysis 2. Oceanographic chemistry.**—*Author's abstract.*

9E–16 551.46:91.04(471.1)

Lisitzin, Eugenie, **A brief report on the scientific results of the hydrological expedition to the rchipelago and Åland Sea in the year 1922.** *Fennia*, Helsinki, 73(4), **1951.** 21 p. 8 figs., 6 ables. **DLC**—The first attempt to get some results from data published 26 years before. Sum- arized data are given for current direction, temperature and salinity distribution. Harmonic dal constants are given on the basis of 10–11 days of water level observations. *Subject Headings:* **. Ocean temperatures 2. Hydrologic expeditions 3. Finnish Archipelago 4. Åland Sea.**—*A.A.*

9E–17 551.46:91.04(267,262)

Pettersson, Hans, **Die schwedische Tiefsee-Expedition 1947/48.** [The Swedish deep-sea xpedition 1947/48.] *Naturwissenschaften*, 38(6):125–128, March **1951.** 2 figs., 20 refs. **DLC**—eals mainly in general terms with ocean floor cores which reached lengths of nearly 19 m. The uccession of deposits showing warm and cool periods is similar in all oceans. Other results briefly entioned. *Subject Headings:* **1. Ocean floors 2. "Albatross" Expedition (Swedish Deep Sea), 947–1948 3. Indian Ocean 4. Mediterranean Sea.**—*C.E.P.B.*

1952

9E–18 551.463:535.37:551.501.81(267.3,265/266)

Baker, F. G., **Phosphorescence. Gulf of Oman.** *Marine Observer*, London, 22(158):190–192, ct. **1952.** fig. Also: **Phosphorescence and radar** [in] **Equatorial Pacific waters.** *Ibid.*, 25(169): 49–150, July **1955. DLC**—Brilliant phosphorescence appeared in the sea around the ship when adar was switched on and disappeared when it was switched off. Discussion mentions the possi- ility that the dinoflagellates causing phosphorescence respond to wave lengths of radar frequency, ut the appearance may have been merely coincidence. In the second article, account of a large atch of phosphorescence which showed as a white patch on radar screen is given. Appended note uggests it was rain or sea clutter. *Subject Headings:* **1. Bioluminescence 2. Radar echoes from hosphorescence 3. Gulf of Oman 4. Equatorial Pacific.**—*C.E.P.B.*

9E–19 551.46

Cruising labs on the Chesapeake. *Johns Hopkins Magazine*, New York, 4(1):14–25, Oct. **1952.** 8 photos. **DLC**—By means of an excellent series of photographs, the various activities of the ohns Hopkins University's Floating Laboratories which cruise up and down Chesapeake Bay are

illustrated. Dredging, water sampling, temperature measurements, light penetration experimen current density, salinity, oxygen content and conductivity measurements, sample cores, and studi of marine flora and fauna are all illustrated and described very briefly. *Subject Headings:* **1. Ocea ographic surveys 2. Oceanographic instruments 3. Marine laboratories 4. Chesapeake B** —*M.R.*

9E–20 551.46(2

Ford, William L.; Longard, J. R. and Banks, R. E., **On the nature, occurrence and orig of cold low salinity water along the edge of the Gulf Stream.** *Journal of Marine Research*, 11 (3) :28 293, **1952.** 7 figs., 12 refs. **DWB**—In the left margin of the Gulf Stream, looking in the directi of flow, a narrow discontinuous band of relatively cold water is often found. This has been attribut to upwelling from the colder depths of the ocean, but recent investigations throw doubt on t explanation, since this water, which forms a thin layer close to the surface, may have a lower salini than any water in the depths. Evidence is given that the only cold low salinity source is the called Shelf water, which is found in a broad band between the shore and a boundary off the C tinental Shelf. It is shown that the cold low salinity water in the margin of the Stream, when mix with the warm high salinity water of its core, may form a product which is identical to the Slc water which lies between the Gulf Stream and the Shelf. It is postulated that this product is d charged to the left of the Stream to form a source of the upper layer of Slope water. *Subject Hec ings:* **1. Salinity 2. Gulf Stream.**—*Authors' abstract.*

9E–21 532:533.

Höppler, F., **Über neuere Messungen der Zähigkeit des Wassers.** [On new measurements the viscosity of water.] *Zeitschrift für Angewandte Physik*, 4 (8) :297–300, **1952.** fig., 7 refs. **DLC** With a new viscosimeter, ratio of viscosities of water at 20°C to air is found as 1:55.41, givi viscosity of water as 1.0080 ±0.1%. *Subject Heading:* **1. Viscosity.**—*C.E.P.B.*

9E–22 551.463:535

le Grand, Yves, **A propos de la pénétration de la lumière dans la mer.** [Penetration of lig into the sea.] *Annales de Géophysique*, 8 (1) :105, Jan./March **1952.** 4 refs. **DWB**—In an earl paper the author had expressed doubts as to the possibility of obtaining photographic response external light on a plate submerged in clear water to a depth of 1000 m. This statement was ticized by D. Barbier who pointed out that light was only diffused but not wholly absorbed clear water and therefore could produce an effect at the mentioned depth, provided that the pl was exposed for a sufficient length of time. In the present note the author maintains his earl view by arguing that diffusion does not basically affect the exponential absorption formula. refers to experiments made at 500 m depth which appear to confirm his hypothesis. *Subject Headi* **1. Light penetration in sea.**—*G.T.*

9E–23 551.460

Lisitsyn, A. P. and Udintsev, G. B., **Dnocherpatel' "Okean-50" i vozmozhnosti ego primener pri okeanograficheskikh issledovaniiakh.** [Dredge "Ocean-50" and the possibilities of its utilizat in oceanographic work.] *Meteorologiia i Gidrologiia*, No. 8:44–46, Aug. **1952.** fig. **DLC**—G performance of the instrument was indicated during tests by the authors at depths from 20 m 4000 m in storms and intense drifting conditions. *Subject Heading:* **1. Oceanographic dredges** *N. T. Zikeev.*

9E–24 551.

Pritchard, D. W. (*Chesapeake Bay Inst. of Johns Hopkins Univ.*), **Salinity distribution a circulation in the Chesapeake Bay estuarine system.** *Journal of Marine Research*, 11 (2) :106–1 Nov. **1952.** 11 figs., table, 3 refs. **DWB, DLC**—The salinity distribution in a coastal plain estu governs the dynamic structure. In the estuaries studied, the salinity increases with depth, salinity-depth curve having the general shape of an inverse tangent function. Though there i layer of relatively rapid increase in salt content with depth, separating an upper less saline la from a lower more saline layer, this haocline is still sufficiently weak to allow a downward rand flux of fresh water as well as an upward random flux of salt. The longitudinal salinity gradien approximately uniform with depth. The salinity is on the average higher on the right side of estuary (looking downstream) than on the left. Superimposed upon the oscillatory tidal mot there is a net circulation in which the upper less saline layer moves seaward and the lower more sa layer moves up the estuary. The boundary between the two layers of net flow has a slight lat slope, being deeper on the right side of the estuary than on the left. As a result of considerati of the salt balance, a net upward vertical motion is implied. A combination of the concepts salt continuity and volume continuity allow the successful computation of the mean net horizon

elocity in the two opposite flowing layers. *Subject Headings:* **1. Salinity distribution 2. Salinity alance of estuaries.**—*Author's abstract.*

9E–25 535.34:537.531:551.463

*Saint-Guily, Bernard, **Différences des coefficients d'absorption de l'eau pure et de l'eau de mer, révues par la théorie dans le domaine des rayons X.** [Difference between the coefficient of absorption of pure and sea water predicted by theory for the region of X-rays.] *Académie des Sciences, Paris, Comptes Rendus*, 235(16):893–894, Oct. 20, 1952. **DWB**—Table shows theoretically calculated coefficient for sea water and for pure water, and observed absorption coefficient for pure water from 0.100Å to 23.3Å. Good agreement occurs up to 1Å between theoretical and observed for fresh water. Not much difference occurs (except in 0.7 and 4.4Å region) between salt and pure water coefficient. In this region the photoelectric and compton effects prevail and the absorption in salt water averages 1.5 times that in fresh water. *Subject Headings:* **1. X-ray absorption coefficient 2. Sea water absorption of X-rays.**—*M.R.*

9E–26 551.464

Saito, Nobufusa, **On the existence of radiocolloids in natural waters.** *I.U.G.G. Association of Scientific Hydrology, Brussels*, 1951, [*Transactions*], v. 3:512–515, 1952. 2 tables, 5 refs. **DWB**—Some results are given on the content of radium and thorium in Japanese rivers and the Pacific Ocean. *Subject Headings:* **1. Radiocolloids 2. Sea water composition 3. Japan 4. North Pacific.**—*A.A.*

9E–27 551.463(261.3)

Skopintsev, B. A., **Opticheskaia kharakteristika organicheskogo veshchestva morskikh vod.** [Optic characteristic of organic material in sea waters.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, 1:57–60, 1952. 8 refs. **DLC**—In order to determine the relative amount of coloring organic compounds (particularly of humus origin) in the total amount of organic matter in sea water, the author calculated the relationship between the magnitude of the coefficient of high attenuation and the oxidizability of the water (or the organic oxygen). The coefficient of attenuation of light was measured in the ultraviolet portion of the spectrum ($\lambda = 436$ mμ) by means of a photometer; the oxidizability of sea water and that for fresh water was determined in a neutral medium. The results of measurements made in the Baltic Sea (Gulf of Riga) and in the Don and Dangava (Latvia) rivers are given. *Subject Headings:* **1. Sea water optics 2. Organic matter in sea water 3. Baltic Sea 4. Don River 5. Dangava River.**—*I.L.D.*

9E–28 535.3:551.46

*†Takenouti, Y., **On the submarine daylight and the allied phenomena.** *Journal of Meteorological Research*, Tokyo, 4(6):268–324, Sept. 1952. figs., tables, refs. p. 321–324, eqs. In Japanese; English summary p. (19–21). **DWB, DLC**—The photometers used in the measurements reported are described; methods, operational details, and errors are discussed. As a result of the submarine light intensity measurements made in various seas around Japan, extensive data are presented on vertical extinction coefficients and their dependence on solar elevation, atmospheric conditions, color of light and sea, wave length and transparency. Diffusion ratios obtained for under-water light sources under various conditions are also tabulated, and the correlation between extinction and diffusion is investigated. The study furthermore includes results of experiments on the visibility and brightness of Secchi's discs of various colors immersed into varying depths. A bibliography containing some 40 references to international literature is added. The fairly complete English summary and figure captions make the essential part of the material accessible to the English-speaking reader. *Subject Headings:* **1. Underwater photometry 2. Extinction coefficients 3. Submarine illumination 4. Visibility in water.**—*G.T.*

9E–29 551.46(263.4)

Texas. Agricultural and Mechanical College. Dept. of Oceanography, **Oceanographic survey of the Gulf of Mexico,** Contract N7onr-487, T.O. 2, Annual Report for 1952, June 14, 1952. 16 p. 6 figs. Also: Annual report for the period June 15, 1952–June 30, 1953, pub. July 30, 1953. 15 p. 10 figs. (1 fold). **DWB**—This administrative report contains a description of the various cruises of the "Alaska" in the Gulf of Mexico (shown on a map), of the progress on the progress on the processing of the physical oceanographic data collected during the various cruises, and an account of some of the special equipment constructed, such as circular slide rule for computing temperature data, a salinity meter, etc. Histograms giving distribution of temperature at various depths are included. (For annual report for June 30, 1953–June 30, 1954, *see* 6.8–64, Aug. 1955, *MAB.*) *Subject Headings:* **1. Oceanographic observations 2. Oceanographic instruments 3. Gulf of Mexico. I. Leipper, Dale F. II. Drummond, Kenneth H.**—*I.L.D.*

9E–30 551.46:018

Tomczak, Gerhard, **Das Bourdonrohr als ozeanographisches Messelement.** [The Bourd tube as an oceanographic instrument.] *Germany. Deutscher Wetterdienst in der US-Zone, Berich* No. 38:347–353, **1952.** 4 figs., 22 refs., 2 eqs. **DWB**—A new pressure measuring instrument of t German Hydrographic Institute is described, in which a Bourdon tube is used, and its accura examined. *Subject Headings:* **1. Oceanographic instruments 2. Bourdon tube.**—*C.E.P.B.*

9E–31 551.464(261,263.

*U. S. Coast and Geodetic Survey, **Density of sea water at Coast and Geodetic Survey ti stations. Atlantic and Gulf coasts.** Its *Special Publication* No. 279 (Rev. 1949 ed.), **1952.** 31 mostly tables. Price: $.25, from Govt. Print. Off., Wash., D. C. **DLC**—Monthly and annu means and extremes for period of record for 50 stations along Atlantic and Gulf Coasts of U. S. fro Eastport, Maine to Key West, Fla., and Port Isabel, Tex. Seasonal variations in average month salinity are shown in parts per thousand on graphs for 23 stations. Records date back to 19 (New York), 1912 (Atlantic City, N. J.) and 1887 (Sandy Hook, N. J.). *Subject Headings:* **1. Oce density data 2. Ocean salinity data 3. Atlantic Coast, U. S. 4. Gulf Coast, U. S.**—*M.R.*

9E–32 551.463

*U. S. Hydrographic Office, **Tables for sea water density.** Its *H.O. Publication*, No. 615, 195 265 p. Almost entirely tables. **DLC**—Extensive tables for computing density for each .01° from −2°C to 30°C, and for 0–20% and 21%–40% salinity. Examples of computation of densi (σ) are given. Tables for interpolation are appended. *Subject Headings:* **1. Ocean density tabl 2. Salinity 3. Oceanographic tables 4. Computation tables.**—*M.R.*

1953

9E–33 551.509.1:551.526.6(263.

Franceschini, Guy A., **Reliability of commercial vessel reports of sea surface temperatur in the Gulf of Mexico.** Texas. Agricultural and Mechanical College. Dept. of Oceanograph Contract AF 19(604)-169, Scientific Report, No. 2, Sept. **1953.** 9 p. 5 figs., 4 refs.—The ter perature distribution of the surface water in the Gulf of Mexico, as determined by certain sho period averages of commercial vessel reports, is shown to be reliable. Comparison is made with t distributions as determined for three periods from data obtained by scientific oceanographic surve made in 1951 and 1952. Comparison is also made with mean monthly sea surface mentione and the suggestion is made that running short period averages of commercial vessel reports be use for practical purposes, i.e., meteorological and oceanographic research, and forecasting air ma modification over the Gulf. *Subject Headings:* **1. Sea surface temperatures 2. Reliability of sh observations 3. Gulf of Mexico.**—*Author's abstract.*

9E–34 551.46(9

Herdman, H. F. P., **The deep scattering layer in the sea: association with density layerin** *Nature*, London, 172(4372):275–276, Aug. 15, **1953.** 3 figs., 5 refs. **DWB**—Report on observatio of echo sounding on R.R.S. "Discovery II" in 1950–51, mostly in Southern Ocean. Scatteri layer found mostly in 165–219 m, sometimes multiple, associated with temperature discontinuitie *Subject Headings:* **1. Echo sounding 2. Southern Ocean.**—*C.E.P.B.*

9E–35 535.36:551.46(267,26

Ivanoff, Alexandre, **Au sujet de la diffusion de la lumière par l'eau de mer.** [Light diffusio by sea water.] *Annales de Géophysique*, 9(1):26–27, Jan./March **1953.** 2 tables, 4 refs., e **DWB**—A short discussion of light density measurements made by JERLOV on the Swedish "Albt tross" Deep Sea Expedition in the central Indian Ocean and the eastern Mediterranean Sea. T maximum of the ratio between the radiation energy diffused in the sea water from below to the energ received from above lies in both cases at 425 mμ. *Subject Headings:* **1. Light density in sea wat 2. Submarine diffusion 3. Indian Ocean 4. Mediterranean Sea.**—*A.A.*

9E–36 551.46

Jerlov, N. G. (*Fishery Board of Sweden, Gothenburg*), **Influence of suspended and dissolve matter on the transparency of sea water.** *Tellus*, 5(1):59–65, Feb. **1953.** 9 figs., table, 16 refs 3 eqs. **DLC**—The transparency at different levels in the sea, as recorded by means of a transparenc meter, is compared with the distribution of suspended particles studied with the aid of a Tyndal meter. A simple procedure is used to distinguish between different components of light extinctio and to derive values of the content of the dissolved yellow substance. The distribution of yello substance is illustrated for the transition area between the Baltic and the Skagerrak and for t outflow of the Göta Alv. It is emphasized that the content of yellow substance may often

nsidered as a characteristic property of a water mass. *Subject Heading:* **1. Sea water transparency.** *Author's abstract.*

9E–37 551.464

Jerlov, N. G. (*Fishery Bd. of Sweden*) and Kullenberg, B. (*Ocean. Inst., Göteborg*), **The Tyndall ffect of uniform minerogenic suspensions.** *Tellus*, Stockholm, 5(3):306–307, Aug. **1953.** 2 figs., ble, 2 refs. **DLC**—During the Swedish Deep Sea Expedition, the size distribution of matter spended in sea water was determined by measuring the Tyndall effect in samples and comparing with known suspensions of quartz and feldspar, derived from clay obtained in the Southern Baltic. rocess is described and data presented in table and on graphs. Range of suspended matter was om 1 to 12μ. *Subject Headings:* **1. Sea water composition 2. Tyndall effect 3. Micromeritics Suspensions in sea water.**—*M.R.*

9E–38 551.46.018:518.3

Kalle, Kurt, **Fluchtentafeln zur Bestimmung der Temperaturkorrekturwerte beim Arbeiten it Kippthermometern.** [Nomograms for determining the temperature correction of reversible ermometers.] *Deutsche Hydrographische Zeitschrift*, 6(1):32–33, **1953.** 4 figs., 2 tables, 5 refs. erman, English and French summaries p. 32. **DWB**—Nomograms are constructed, based on ANSEN-SCHUMACHER correction tables, for rapid application to reversing deep-sea thermometers. *ubject Headings:* **1. Deep sea thermometry 2. Nomograms.**—*C.E.P.B.*

9E–39 532.593:532.61

Keller, Joseph B. and Goldstein, Edward (*Inst. for Math. and Mechanics, N. Y. Univ.*), **Water ave reflection due to surface tension and floating ice.** *American Geophysical Union, Transactions*, 4(1):43–48, Feb. **1953.** 4 figs., 2 refs., 3 eqs. **MH-BH**—Assuming that depth is small compared o wave length, the reflection of water waves is studied from a region covered by floating matter flexible mat, broken ice field, debris) or having an appreciable surface tension (thin sheet of canvas s aircraft landing strips for use on the ocean). In the entirely theoretical discussion, a dimensionless riterion is developed for the behavior of the reflection coefficient, dependent on floating mass per nit area and wave characteristics. *Subject Headings:* **1. Wave reflection 2. Ice fields . Surface tension.**—*A.A.*

9E–40 551.464

Lineĭkin, P. S., **O raspredelenii solenosti v melkovodnom more.** [Distribution of salinity in a hallow sea.] *Akademiia Nauk SSSR, Moscow, Doklady*, 91(1):71–73, July 1, **1953.** 16 eqs. **DLC**—The author develops an equation for determining the salinity of a shallow sea, in which mixing roduces complete homogeneity, as a function of surface and depth coordinates x, y and $H(x,y)$, espectively, and time t. On the basis of an equation that is analogous to the equation of con- inuity in long waves, etc., calculation of the change of salinity in unit column of wall on the basis f linear transport and turbulent diffusion, an equation is derived for determining approximately the istribution of salinity independent of a knowledge of the velocity of current flow. *Subject Heading:* **. Salinity distribution.**—*I.L.D.*

9E–41 551.46.018

Malkus, Willem V. R. (*Woods Hole Oceanographic Inst., Woods Hole, Mass.*), **A recording athypitometer.** *Journal of Marine Research*, 12(1):51–59, **1953.** 5 figs., 2 refs. **DWB**—The tability of a cable towed through the sea has suggested the use of its weighted end as a platform for elocity measurement. This report describes an instrument, lowered on standard hydrographic wire, which uses mechanical sensors to record speed, temperature, and pressure on a waxed paper oll. Initial measurements are presented which indicate that the vertical profile of an ocean current an be determined in approximately one hour. *Subject Heading:* **1. Bathypitometers.**—*Author's bstract.*

9E–42 551.46.018

Nan'niti, T. (*Met. Res. Inst., Tokyo*), **How to select the observation points.** *Papers in Meteor- logy and Geophysics*, 4(2):74–78, Sept. **1953.** 2 figs., ref., 22 eqs. **DWB**—Required density of ceanographic networks and time-intervals between measurements are theoretically determined as unctions of distribution patterns and variations of oceanographic elements. *Subject Headings:* **1. Oceanographic networks 2. Oceanographic conditions.**—*G.T.*

9E–43 551.46

Ritchie, G. S., **The deep scattering layer.** *Institute of Navigation, Journal*, 6(4):395–402, Oct. **1953.** 7 figs., 5 refs. **DWB**—Discussion of causes (probably plankton and fish) of scattering layer,

between 20 and 250 fathoms, of sonic and ultrasonic transmissions. No correlation was found wi bathythermograph readings. *Subject Heading:* **1. Echo sounding.**—*C.E.P.B.*

1954

9E–44 551.46:551.526.6:576.8(261

*Buch, Kurt, **Physikalische und chemische Verhältnisse in Beziehung zur biologischen Aktivit im Wasser des Südwestlichen Schärenmeeres von Finnland.** [Physical and chemical conditio in their relation to the biological activity in the waters of the southwestern Schären Sea of Finlanc *Finland. Merentutkimuslaitos, Julkaisu*, No. 150, **1954.** 36 p. 7 figs., 2 tables, 16 refs. **DLC** Depth curves of temperature, salinity, pH, O_2, CO_2, P, plankton amount, etc., were taken at regular intervals. Data are related to the winter convection, ice cover, ice melting, spring cc vection, summer stratification and the cooling in autumn. Some production values are compute *Subject Headings:* **1. Sea water composition 2. Sea temperature 3. Plankton 4. Baltic S 5. Finland.**—*A.A.*

9E–45 551.

Capurro, Luis R. A. (*Dir. Gen. de Navigación y Hidrografía Buenos Aires*), **Physical ocea ography in the Argentine Republic.** *I.U.G.G. Association of Physical Oceanography, Rom Sept. 14–25, 1954, Procès-Verbaux.* Bergen, **1954.** p. 155–160. **DWB**—Since 1953: (1) t Dirección General de Navigación y Hydrografía is responsible for the overall investigations physical oceanography; (2) courses of physical oceanography were established at the University Buenos Aires; (3) the Fisheries Research Division was created within the Argentine Dept. of Ag culture; (4) laboratories were established and personnel trained to deal with problems of submari geology and chemistry of sea water by the National Institute for Research of Natural Scienc Today all the organizations are working in perfect coordination using data obtained from t "Operation Merluya" (1954). *Subject Headings:* **1. Oceanographic research 2. Physical ocea ography 3. Argentina.**—*A.M.P.*

9E–46 551.501.1:551.5

Clayton, William H., **Temperature measurements of Caplen Pier.** Texas A. & M. Colle Dept. of Oceanography, Contract N7onr-48702, Project NR 083-036, Project 24C, Technical Repo Aug. **1954.** 15 p. 6 figs. (incl. photos), 2 refs. **DWB**—A measuring system employing coppe constantan thermocouples for multi-point temperature determination at Caplen Pier is described detail. A quantitative review of the establishment of accuracy limits (±.05°F) of this system is al presented. *Subject Heading:* **1. Water temperature measurement.**—*Author's abstract.*

9E–47 551.46.018(0

Deacon, G. E. R., **Exploration of the deep sea.** *Institute of Navigation, London, Journa* 7(2):165–174, April **1954.** 3 figs., 15 refs. **DLC**—Historical account of: 1) measuring depths of s since 1773 and sampling ocean floor, including radioactivity and heat flow; 2) chemical analyses sea water since 1772; 3) deep sea temperature (first measurements at 650 and 890 fathoms in 174 and development of sea thermometers. Circle of uniform temperature with depth found by Ro in 1847 agrees with Antarctic convergence line (1946). Possibility of new advances is discusse *Subject Heading:* **1. History of oceanography.**—*C.E.P.B.*

9E–48 551.464(262.

Dobrzhanskaia, M. A., **O nitratakh v Chernom more.** [Nitrates in the Black Sea.] *Akademi Nauk SSSR, Doklady*, 99(1):61–64, Nov. 1, **1954.** 2 figs., table, 10 refs. **DLC**—Data are presente on the annual variation of NO_3 content of the waters of the Black Sea. The author discusses t distribution of nitrates in the open sea, in bags at different depths and the N/P rate. *Subject Hea ings:* **1. Nitrates in sea water 2. Salinity 3. Black Sea.**—*I.L.D.*

9E–49 551.4

Ehrlich, Albert, **Subsurface density inversions off Nantucket Island.** *American Geophysic Union, Transactions*, 35(4):573–584, Aug. **1954.** 8 figs., 2 tables, 19 eqs., 8 refs. **DLC**—Statio occupied south of Nantucket Island in the region of the discontinuity between the outflow wate of the Gulf of Maine and the denser offshore water, show density inversions in the middle leve The inversions are correlated with the tidal period, but not with the diurnal period. Rayleigh instability criteria and other methods are used to investigate the conditions under which su inversions can exist. An equation is derived to obtain current velocities at different levels throug out the tidal period, from the surface tidal currents. Trajectories for each level indicate extensi overrunning of the lower layers by the upper layers during each tidal period. The magnitude of t overrunning is sufficient to reverse the slope of the discontinuity surface between the Gulf of Mai

waters and the offshore waters, and to cause the inversions observed. A comparison between the conditions off Nantucket Island and cases of instability in other parts of the Atlantic Ocean shows basic dissimilarity between them. *Subject Headings:* **1. Subsurface density inversions 2. Current velocities 3. Gulf of Maine.**—*Author's abstract.*

9E–50 551.46

Emery, K. O. (*Univ. of Southern Calif.*), **Source of water in basins off Southern California.** *Journal of Marine Research*, New Haven, Conn., 13(1):1–21, Oct. **1954.** 6 figs., table, 15 refs., append. p. 15–21, entirely tables. **DWB**—Water temperature and salinity measurements from most of the 14 basins off Southern California, when compared with older data, show no detectable changes. The water in each basin is nearly isothermal and isohaline from the bottom to near the sill depth. Water temperatures indicate that the bottom water of most basins must have travelled from basin to basin in a general northwesterly direction while that of the outermost basins came directly from the open sea on the west. Each sill in the path of the water acts as a submerged dam which holds back the water that is deeper than the sill itself. The densest water which can cross, that near the sill depth, occupies each basin from its bottom to near its sill depth. *Subject Headings:* **1. Oceanography 2. Southern California Coast.**—*Author's abstract.*

9E–51 551.5:551.46

Guilcher, André, **Chronique océanographique.** [Oceanographic chronicle.] *Norois*, Poitiers, France, No. 1:83–93, Jan./March **1954.** 3 figs., numerous refs. Abstracted from reprint. **DWB**—A section on physical and economical oceanography consisting of reviews of papers, books and meetings, and of miscellaneous notes and news. Some of the material discussed is of interest to the meteorologist, such as a review on surge in the Atlantic (with the effect of wind regime on the direction of surge mentioned) and notes on the storm tides of Jan.–Feb. 1953 in the North Sea, on sea temperature variations off the coast of Japan, and on quaternary climatic variations in the S.E. Pacific. *Subject Headings:* **1. Oceanography 2. Marine meteorology.**—*G.T.*

9E–52 551.464:546.21(265.4)

*Ichye, Takashi (*Kobe Marine Obs.*), **On the distributions of oxygen and their seasonal variations in the adjacent seas of Japan. Pt. 1 and 2.** *Oceanographical Magazine*, Tokyo, 6(2):41–100, Aug. **1954.** 45 figs., 2 tables, 37 refs., eqs. **Pt. 3,** *Ibid.*, 6(3):101–131, Nov. **1954.** 19 figs., 5 tables, 11 refs. **Pt. 4,** *Ibid.*, 8(1):1–27, Aug. **1956.** 23 figs., 11 refs., numerous eqs. **DWB, DLC**—In Pt. 1 there is an elaborate analysis of data obtained since 1946, presenting horizontal and vertical sections comparing oxygen conditions in the Japan Sea with those in the Pacific and discussing physical aspects (theoretical and empirical) concerned with horizontal and vertical isentropic and advective currents. Pt. 2 takes up seasonal variations in stability O_2-Cl, T-Cl, and consumed O_2 at different depths and places, and change of surface water temperature and chlorinity with distance from source in melting ice and heating regions, with many tables and diagrams. Pts. 3 and 4 contain similar extensive material for the Kuroshio current region and the polar front region. *Subject Headings:* **1. Oxygen variations in seas 2. Chlorinity 3. Sea of Japan.**—*M.R.*

9E–53 551.46(02)

I.U.G.G. Association of Physical Oceanography, Rome, 1954, **Report of Committee on Preparation of a Technical Handbook on Physical Oceanography.** H. U. Sverdrup, chairman. Its *Procès-Verbaux*, pub. Bergen, **1954.** p. 100. **DWB**—Only one of 5 contemplated sections of the handbook **Processing oceanographic data** by C. E. La Fond (9E–154), has been completed and was published by the U. S. Navy Hydrographic Office in 1951. In view of the dim prospects of completion of the other sections, it proposed the preparation by a single person of an elementary book on methods in physical and chemical oceanography which would be examined and approved by the Committee before its publication. *Subject Headings:* **1. Physical oceanography 2. Handbooks. I. Sverdrup, H. U.**—*A.M.P.*

9E–54 551.5:551.46

*Japan. Central Meteorological Observatory, Tokyo, **Results of marine meteorological and oceanographical observations, No. 12, pt. 1, Oceanography, July/Dec. 1952.** pub. April **1954.** 138 p. mostly tables. **DLC**—The contents of this volume include serial oceanographic observations made during July–Dec. 1952 in the various oceanic sections and plankton observations for the period July–Dec. 1951 and Jan.–Dec. 1952. Maps showing the oceanographical sections, and stations for July–Sept. 1952 and Oct.–Dec. 1952 are reproduced. *Subject Headings:* **1. Oceanographic observations 2. Marine meteorological data 3. Japan.**—*I.L.D.*

9E–55 551.465(265.4

Kobe, Japan. Marine Observatory. Oceanographical Section. **On the hydrography of th Osaka-Wan and the Kii-Suido, 1953.** *Japan. Central Meteorological Observatory, Tokyo, Ocean ographical Report*, 3(3):7–36, July **1954.** numerous figs., 4 tables, 8 refs. In Japanese; Englis summary, p. 7. **DWB**—The oceanographical observation was made in the Osaka-Wan and Ki Suido in 1953 by the Kobe Marine Observatory every month. In this paper we treated the hy drography of these waters using the observational data. Pt. I. Water temperature and chlorinity The distributions of water temperature and chlorinity of the regions in each month are shown. I the Osaka-Wan, the effects of river waters are predominant but in the Kii-Suido the penetration c off-shore waters is observed. Harmonic analysis is practiced, the results of which show the cha acteristics of inland sea in the Osaka-Wan and those of the transition region between coastal an off-shore waters in the Kii-Suido. Pt. II. Dissolved Oxygen, Phosphate-P and Silicate-Si. Th general aspects of the distributions of chemical components, dissolved oxygen, phosphate-P an silicate-Si, are shown: 1) An outlook of their distributions by integrated mean values. Thei distributions are affected by river waters flowing in the Osaka-Wan and by off-shore waters in th Kii-Suido. 2) The mutual correlation coefficients of O_2P, O_2Si and PSi, the mean value and th variance. The relations between the density *in situ* and the saturation percentage of dissolve oxygen, and the annual variation of deviation are studied. *Subject Headings:* **1. Oceanographi observations 2. Hydrography 3. Oceanographic chemistry 4. Osaka Bay 5. Kii Channel.**— *Author's abstract.*

9E–56 551.521.17:551.463(262

Lenoble, Jacqueline, **Sur quelques mesures de la pénétration du rayonnement ultraviolet dan la Méditerranée.** [Measurements of the penetration of UV radiation into the Mediterranean Sea. *Académie des Sciences, Paris, Comptes Rendus*, 239(25):1831–1833, Dec. 20, **1954.** 3 tables, 2 refs **DWB**—A spectrophotographic study of UV light penetration into the sea was made at Monac during a few days in the summers of 1953 and 1954. Vertical downward radiation is generall reduced to 1/10th of its value around 30 m for 4000Å, and around 15 m for 3200Å. A few measure ments were also made of upward and horizontal radiation. *Subject Headings:* **1. Ultraviolet radiatio penetration into sea 2. Mediterranean Sea.**—*Trans. of author's abstract.*

9E–57 551.46:532.

Montgomery, R. B. and Wooster, Warren S., **Thermosteric anomaly and the analysis of seria oceanographic data.** *Deep-Sea Research*, London, 2(1):63–70, Oct. **1954.** 3 figs., table, 7 refs. 5 eqs. **DWB**—The pressure terms in the anomaly of specific volume of sea water are found to b negligible for hydrostatic computation in such regions as the upper layers of the equatorial Pacifi Ocean. It is proposed that the anomaly of specific volume with pressure terms omitted will b called thermosteric anomaly. This quantity is recommended for routine use in the tabulation an analysis of serial data. The systematic analysis of a vertical section can include hydrostatic com putation by either of two graphical methods, one being WERENSKIOLD's method. *Subject Heading* **1. Oceanographic computations.**—*Authors' abstract.*

9E–58 551.526.6 551.46(265.4

Nagasaki, Japan. Marine Observatory. Oceanographical Section, **Report of the ocean ographic conditions in the Goto-nada in 1953.** *Japan. Central Meteorological Observatory, Tokyo Oceanographical Report*, 3(3):37–48, July **1954.** 11 figs., table. In Japanese; English summary p. 37. **DWB**—The serial oceanographical observations were carried out in the waters near th Goto-nada almost every month in 1953. The variation of oceanic conditions of water temperature chlorinity, oxygen, silicate and phosphate was investigated. *Subject Headings:* **1. Oceanographi observations 2. Ocean temperatures 3. Oceanographic chemistry 4. Goto Archipelago, Japan** —*Author's abstract.*

9E–59 551.46(267

Phosphorescent wheels [in] Arabian Sea [and] Gulf of Thailand. *Marine Observer*, 24(164) 73–75, April **1954.** fig. Also: Rodewald, M., **Phosphorescent wheel.** *Ibid.*, 24(166):233–234 Oct. **1954.** table. Note by E. W. Barlow, p. 234–235. See also p. 206–207. fig. Also: Rodewald M., **Das Rätsel des rotierenden Meerlichts.** [The enigma of the rotating sea light.] *Wetterlotse* 70(89–96), May **1954. DWB**—The first paper states that on April 5, 1953, in 22°42′N, 68°8′E shafts of pale white diffused light on sea surface approached ship from all directions and sometime formed spokes of a rotating wheel. Similar observation on April 24 in 6°50′N, 103°10′E. Cause discussed but not known. Referring to *Marine Observer*, 24(164):73–75, April **1954,** RODEWALD describes a rotating wheel in the Gulf of Oman Nov. 5, 1953, appearing 1 m above the surface. BAR LOW gives statistics of frequency of occurrence and quotes suggestions by RODEWALD as to thei

rigin. A further case on Nov. 12, 1953 in the South China Sea is described on p. 206–207, with gure. The third article states that on Nov. 5, 1953, in Gulf of Oman, rotating diffuse bright streaks bout a meter above sea suddenly appeared over an area 2 mi across. It occurred at limit of two ir streams, NW and S, in low pressure and high but decreasing temperature. Two similar cases om *Marine Observer* are quoted. Cause is unknown. *Subject Headings:* **1. Phosphorescent wheels . Gulf of Oman 3. Gulf of Thailand 4. Arabian Sea. I. Barlow, E. W.**—*C.E.P.B.*

9E–60 551.464

Rubin, Thor (*McPherson Chemical Lab., Ohio State Univ., Columbus*), **The salinity of the ocean.** *cience,* 119(3080):66–67, Jan. 8, **1954.** table, 18 refs. **DWB**—Discusses chemical balance in the ydrosphere and atmosphere for halides and nitrogen. The probable accumulated nitrogen content n ocean sediments (1.0×10^{14} metric ton-atoms) is not enough for an equilibrium so that an earlier tmosphere containing ammonia and methane is assumed. Nitrogen can form in such a gas mixture n the presence of light or by electrical discharges. *Subject Headings:* **1. Oceanographic chemistry . Nitrogen 3. Halides 4. Salinity.**—*A.A.*

9E–61 551.46:016

†Tenani, M. (*Inst. Idrografico della Marina, Genoa*), **Rapporto sui lavori oceanografici in Italia, .951–1954.** [Report on work in oceanography in Italy, 1951–1954.] *I.U.G.G. Association of Physical Oceanography, Rome, Sept. 14–25, 1954, Procès-Verbaux,* Bergen, **1954.** p. 163–169. ibliog. p. 165–169. **DWB**—Three types of research in oceanography are reported: 1) Physical ceanography (Trieste, Genoa), 2) Tidal research (Venice), and 3) Biological oceanography (Venice nd Padua). The bibliography is divided into sections on sea level, optics, waves, marine meteor- logy, surface currents, salinity and temp., erosion, tides and, finally, marine biology. *Subject Headings:* **1. Oceanographic research 2. Oceanography bibliographies.**—*M.R.*

9E–62 551.464(265/266)

*U. S. Coast and Geodetic Survey, **Density of sea water at tide stations, Pacific Coast, North and South America, and Pacific Ocean islands.** 4th ed., with data through 1953. Its *Special Publication* No. 281, **1954.** 63 p. numerous figs., almost entirely tables. **DLC** (GC151.U62 1954)—Data for 119 stations all over Pacific area and coastal estuaries include monthly mean and annual mean and extreme densities for each month or year of record through 1953 and monthly mean salinity curves for 49 stations. Salinities vary from >36 ppm throughout year (Guaymas, Mex.) with little seasonal variation, to <3 ppm at Astoria, Ore., throughout year, and at some places a range from <5 ppm in summer to 32 ppm in Feb. (Skagway, Alaska). *Subject Headings:* **1. Ocean density data 2. Salinity data 3. Pacific Ocean.**—*M.R.*

9E–63 551.46.018(02)

U. S. Hydrographic Office, **Bathythermograph observations.** Its *H. O. Publication,* No. 606-c, **1954.** 12 p. photos, forms. Text continued on back cover. (fold.) Note: originally pub. 1952, rev. **1954. DWB**—Complete instructions are given (with ample illustrations) for preparing a bathythermograph, lowering into the sea, hauling it in, removing and processing slides, recording and reporting data. The additional weather elements [surface temperature, wind force, air temperature, pressure, weather (00 to 99 in WMO Code), clouds, visibility, and state of sea] and how to record them are also set forth, together with Codes. A motion picture showing actual operations is also available at the U. S. Hydrographic Office for training purposes. *Subject Headings:* **1. Bathy- thermographs 2. Oceanographic observations 3. Observers manuals.**—*M.R.*

9E–64 532.1:551.46.018:91.04(265)

ZoBell, Claude E., **Some effects of high hydrostatic pressure on apparatus observed on the Danish Galathea Deep-Sea Expedition.** *Deep-Sea Research,* London, 2(1):24–36, Oct. **1954.** 4 figs., table, 14 refs. **DWB**—Certain glass apparatus was adversely affected by hydrostatic pressure when submerged to great depths in the Philippine Trench on the Danish "Galathea" Deep-Sea Expedition of 1950–52. Hollow glass balls, used to signal when collecting gear touched bottom, as well as reversing thermometers were broken by the pressure at depths exceeding 9000 m. Their failure, an implosion, was followed by a forceful explosion. An attempt is made to explain the explosion upon a basis of field observations. Capillary tubes used on the ZoBell bacteriological water sampler withstood pressures exceeding 1000 atmospheres, but unless filled with water they were plugged and broken by the intrusion of connecting rubber pressure tubing. *Subject Headings:* **1. Pressure effects on oceanographic instruments 2. Deep sea soundings 3. "Galathea" (Danish Deep-Sea) Expedition, 1950–52 4. Philippine Trench, Western Pacific.**—*Author's abstract.*

1955

9E–65 551.4

Abe, T. (*Met. Res. Inst., Japan*), **A note on the analogy between the coagulation process s colloidal particles and that of bubbles in foam layer of sea water (A study on the foaming of s water).** *Papers in Meteorology and Geophysics*, Tokyo, 6(1):56–62, May **1955.** 6 figs. (incl. phot 3 tables, 3 refs., 6 eqs. **DWB**—The coagulation process of bubbles in the foam layer of sea wat was studied and the following results were obtained. 1) During the period when the coagulati process of bubbles is dominant, the process can fairly well be treated by analogy with that of co loidal particles (Section 2, ii, iii). 2) The maximum diameters of bubbles at various times we calculated by the formula previously derived by the present author, namely $p_{(x)} = A \cdot B^x$, where p is the frequency of a bubble, x the square of its diameter, and A and B are constants (Section Subject Headings: **1. Foam layer of sea water 2. Coagulation process of bubbles.**—*Author's abstra*

9E–66 551.556.8:551.463(26

Abe, T. (*Met. Res. Inst., Japan*), **A tentative analysis of wind wave data in view of the foami of sea water (A study on the foaming of sea water).** *Papers in Meteorology and Geophysics*, Toky 6(2):164–171, Sept. **1955.** 7 figs., 5 tables, 7 refs., 7 eqs. **DWB**—The author treated tentative the relation between the wind wave scales and the surface water temperatures in an open sea usi the data of oceanographical observations taken at the Northern Fixed Point (39°N, 153°E) in t North Pacific Ocean with a view to the foaming of sea water, and the following results were obtaine 1) The general features of the annual variation in wind waves were discussed (Section 3). 2) T probability (P_3) of the appearance of the wind wave of scale 3 has a tendency to decrease with i creasing surface water temperature, that is to say, the lower the surface water temperature becom the stronger the foaming ability (Section 4). 3) A quantity $S(=\tau h_0)$ was defined, which is physical significant, in order to indicate the degree of foaming in actual cases, where τ and h_0 represent t half life and the initial height of foam layer, respectively. Using the values of the quantity calc lated from the results of his laboratory experiments, the author could ascertain that the relationsh mentioned above holds good approximately (Section 5). (For Pt. 2 [?], *see* 9E–104.) *Subje Headings:* **1. Foam layer of sea water 2. Wind waves-temperature decrease-foam relationships.**— *Author's abstract.*

9E–67 551.461(261:7

Anderson, W. W. (*U. S. Fish & Wildlife Service, Brunswick, Georgia*) and Abel, R. B. (*U. Navy Hydrographic Office, Wash., D. C.*), **Expeditions of the M/V Theodore N. Gill off the Sout Atlantic coast of the United States, 1952–1954.** *American Geophysical Union, Transactions*, 36(6 1067–1068, Dec. **1955. DWB, DLC**—The U. S. Navy Hydrographic Office, the Fish and Wildli Service, and Office of Naval Research are jointly prosecuting a program of the oceanography of t offshore waters from Hatteras to Straits of Florida. A two-year program of bimonthly cruises ha recently terminated. Measurements of physical and biological properties, chemical content, an meteorological conditions were carried out. *Subject Headings:* **1. Oceanic surveys 2. Atlanti Coast of United States.**—*Authors' abstract.*

9E–68 681.1:551.46:01

Culbertson, Margaret F., **An oceanographic slide rule for computing temperature, depth, an salinity.** *American Geophysical Union, Transactions*, 36(3):473–480, June **1955.** 3 figs., 2 table 5 refs. **DWB**—To simplify the processing of oceanographic data obtained at sea, a slide rule ha been designed for rapid and accurate computation of temperature and depth from reversing ther mometer readings, depth from wire length and wire angle, and salinity from values of temperatur and electrical conductivity. The rule may be used to correct both protected and unprotecte reversing thermometers, and has the advantage that individual thermometer characteristics, suc as V_0 and Q values and index corrections, may be recorded directly on the rule, thus eliminatin the need to carry other records. Depth from thermometer readings is obtained both when Q, th pressure coefficient of the unprotected thermometer, is constant with depth, and in a special case c variable Q, hence a good estimate of depth may be made for any behavior of Q with depth. The rul also carries depth and temperature conversion scales, and has a logarithmic scale which may be use in the manner of any slide rule. *Subject Headings:* **1. Oceanographic slide rules 2. Ocean tem perature measurement 3. Salinity.**—*Author's abstract.*

9E–69 551.46

Czepa, Otto, **Eichwerte der Farbskala von FOREL zur Bestimmung der Meerwasserfarbe** [Reference values of the Forel color scale for determining sea water color.] *Acta Hydrophysica* Berlin, 2(4):145–147, **1955.** 2 tables, 5 refs. **DLC**—FOREL's subjective color scale, prepared by mixture of copper-sulfate and potassium chromate, is evaluated in absolute terms giving the per

entage of red, green and blue for each number of the scale, as well as the wave length with the maximum transparency and the wave length of the same color tone. *Subject Headings:* **1. Sea water color 2. Forel's color scale.**—*A.A.*

9E–70 551.46:91.04 551.526.6(83)

de Buen, Fernando, **Notas sobre un viaje de estudios de oceanografia aplicada en el extremo norte de la costa chilena.** [Notes on an oceanographic expedition carried out along the extreme northern coast of Chile.] *Compañía Administradora del Guano, Lima, Boletín Cientifico*, 2:25–39, **1955.** 5 figs., tables. **DWB**—This report of the oceanographic expeditions conducted in Nov. and Dec. 1953 in the region of Iquique, Chile, contains a discussion and observations on the color of water and its relation to water temperature. A comparison of water temperatures of Nov. and Dec. 1953, with that of July 1953, water temperature at the surface to a depth of 100 m during Nov., Dec. and July 1953 is given. *Subject Headings:* **1. Oceanographic expeditions 2. Ocean temperatures 3. Northern Chile coast.**—*I.L.D.*

9E–71 551.463(71)

Dunbar, M. J., **Density inversions in Canadian eastern Arctic waters.** *Nature*, London, 176(4484):703, Oct. 8, **1955.** fig., 3 refs. **DWB**—"Calanus" expeditions 1949–51 observed inversions showing unstable conditions in the sea in Ungava Bay, Hudson Strait and Frobisher Bay at 20 out of 48 stations. Ten occurred in the first 3 hours of the ebb tide. *Subject Headings:* **1. Ocean density inversions 2. Canadian Arctic.**—*C.E.P.B.*

9E–72 551.48(261)

Elliott, Francis E.; Myers, William H. and Tressler, Willis L. (*all, U. S. Hydrog. Off.*), **A comparison of the environmental characteristics of some shelf areas of eastern United States.** *Washington Academy of Sciences, Journal*, 45(8):248–259, Aug. **1955.** 7 figs. **DLC**—Article discusses and illustrates some aspects of physiography, temperature, salinity, tidal and wind currents, sea-level, transparency, color, climatology and fouling of coastal waters from Boston to Charleston, S. C. *Subject Headings:* **1. Hydrography of shelf areas 2. Ocean temperatures 3. Atlantic Coast of U. S.**—*M.R.*

9E–73 551.526.6:551.463(265)

Fukuoka, Jiro (*Central Met. Obs., Tokyo*), **Oceanic condition in the north-western Pacific Ocean (Preliminary report).** *Records of Oceanographic Works in Japan*, Tokyo, n.s., 2(2):102–107, Oct. **1955.** 6 figs., 5 refs. **DWB**—Isotherms for the 400 and 600 m layer, and isohalines for the 100 m layer in Aug. 1939 for 0–35°N and 125–155°E, based on Japanese research vessel data, are presented and discussed as a sample of what the author intends to do for all of the data for the summer of 1939 for the Northwest Pacific. Graphs show vertical distribution of Sigma-*t* at different latitudes to depth of 1200 m. The stability is shown to be different N of 20°N than to the S where water is stably stratified. *Subject Headings:* **1. Ocean temperature charts 2. Northwest Pacific.**—*M.R.*

9E–74 551.46(265)

Hakodate. Marine Observatory. Oceanographical Section, **Report of the oceanographical observations east off Sanriku District in 1954.** *Japan. Central Meteorological Observatory, Tokyo, Oceanographical Reports*, 4(1):25–45, June **1955.** 57 figs., table, 4 refs. In Japanese; English summary p. 25. **DWB**—The oceanographical observations were made in the sea east off Sanriku on board the R.M.S. "Yūshio-maru" during Feb. 22 to Mar. 19, May 22 to June 10, Aug. 7 to 26 and Nov. 30 to Dec. 17, 1954. The fluctuation of oceanic conditions was investigated by means of studying the distribution of the water temperature, chlorinity, dissolved oxygen and current. 1. The northward extension of the Kuroshio branches was remarkable off the coast of Sanriku, and the warm water mass was observed at more northerly points than in normal years. 2. The Oyashio cold water appeared in one place to the south-east off the Kuroshio and in two places to the east off Miyako, and the near shore one was not so remarkable and the off-shore one was strong reaching more southward than normal years in winter to spring 1954. 3. After passing off Shiriya-saki the Tsugaru warm current was not so strong during 1954, and the boundary between the Oyashio current and the Tsugaru warm current was observed at 142–143°E and the velocity was slower than in 1947–1948. *Subject Headings:* **1. Oceanographic observations 2. Kuroshio Current 3. North Pacific.**—*Author's abstract.*

9E–75 551.465(265) 551.526.6(265)

*Hanzawa, Masao, **Preliminary report on some characteristics of the Kuroshio off the south coast of Japan, Jan.–June, 1952.** Florida. State Univ. Dept. of Meteorology, Contract Nonr-1600(00), Technical Report, No. 3, Nov. 15, **1955.** 52 p. 40 figs., tables, 10 refs. **DWB**—In this report, a general oceanographic description of the Kuroshio off the coast of Shiono-misaki, in the

period from Jan. to June 1952, is given in terms of cross-sections of temperature, chlorinity, oxyge content and sigma-*t*, and T-Cl diagrams. Some brief comments on water-mass characteristics an on short-range changes in oceanic conditions are also given. According to the observations, on does not encounter the distinct slope and coastal water which are usually found off the east coast the U. S., on the left-hand side of the Florida Current or Gulf Stream. A detailed analysis will l given in a future report. *Subject Headings:* **1. Ocean currents 2. Ocean temperatures 3. Kur shio Current 3. North Pacific.**—*Author's abstract.*

9E–76 551.46

Hikosaka, Shigeo (*Hydrographic Office, Japan*), **On the vertical distributions of density an upwellings in cold water mass.** *Records of Oceanographic Works in Japan*, Tokyo, n.s., 2(1):19–2 March **1955.** 4 figs., 3 refs., 9 eqs. **DWB**—In this paper, we estimated the mean velocity of u welling, using the observed actual temperature distributions in cold water, and then calculated th vertical distribution of density in an upwelling region. The results are in good agreement with th observed density distributions, excepting the layers near the surface. *Subject Headings:* **1. Upwellin 2. Sea water density.**—*Author's abstract.*

9E–77 551.463:535.37:621.396.826(2

Hilder, Brett, **Radar and phosphorescence at sea.** *Nature*, London, 176(4473):174–175, Ju **23, 1955. DWB**—Two cases of apparent stimulation of phosphorescence by radar are describe off New Guinea and Solomon Islands. The latter pulsated in exact time to the beat of the shi engines. The cause is discussed. *Subject Headings:* **1. Bioluminescence 2. Radar echoes fro phosphorescence 3. South Pacific.**—*C.E.P.B.*

9E–78 551.524.32:551.526.6(26

Hishida, Kozo (*Maizuru Marine Obs.*), **Annual variation of sea-surface water temperature an air temperature in the western parts of North Pacific Ocean.** *Records of Oceanographic Works Japan*, Tokyo, n.s., 2(3):79–84, Oct. **1955.** 5 figs., 3 refs. **DWB**—Sea water and air temperatu data from the U. S. W. B. atlas of **Climatic charts of the oceans** (1938) for the Western Pacific (10 55°N, and 120° to 180°E) are compiled, using the method of harmonic analysis, to show the ge graphical relationships of sea, air, and sea-air temperature between 5° squares of lat. and lon Effect of continent, and of the Kuroshio and Oyashio in producing anomalies in actual temperatu as well as in phase (lag from Aug. maximum) is seen on charts. *Subject Headings:* **1. Air-sea tem perature variations 2. Annual sea water temperature variations 3. Western North Pacific.**—*M.*

9E–79 551.464:546.35

Ishibashi, Masayoshi and Hara, Tadashi (*both, Kyoto Univ.*), **On the content of rubidium an cesium in seawater.** *Records of Oceanographic Works in Japan*, n.s., 2(1):45–48, March **195** 2 tables, 10 refs. **DWB**—Samples obtained at Koganoura in Shizuoka Prefecture, 6 mi west Shirahama in Wakayama and at Suma in Hyogo Prefecture, Japan, gave concentrations of 2 ~400μ of rubidium and 3.3~4.3μ of cesium in one litre. Methods are described for precipitatir along with potassium cobalt nitrite using $Na_3Co(NO_2)_6$, and for separation of Rb and Cs from th potassium, and gravimetric determinations of rubidium and colorimetric determination of cesiur *Subject Headings:* **1. Sea water analysis 2. Rubidium in sea water 3. Cesium in sea water 4. J pan.**—*M.R.*

9E–80 551.461(265) 551.526.6(26

Ishino, Makoto (*Tokyo Univ. of Fisheries*), **Hydrographic survey in the equatorial Pacific Ocea the South China Sea and the Formosa-Satsunan Kuroshio Region.** *Records of Oceanograph Works in Japan*, Tokyo, n.s., 2(1):125–131, March **1955.** 4 figs. **DWB**—This report is based the observations during the period from June 21 to Aug. 11, 1954 by "Umitaka Maru" (754 tons the training ship of the Tokyo University of Fisheries. Observations at 45 stations carried out the Equatorial Pacific Ocean, the South China Sea and the Formosa-Satsunan Kuroshio regio The profiles of water temperature, chlorinity, density and saturation percentage of dissolved oxyge (%) are shown. Fig. shows surface currents measured by the drift of ship and the inclined directi of sounding wire, in addition to those measured by the current float. *Subject Headings:* **1. Ocea ographic surveys 2. Sea temperatures 3. Pacific Ocean.**—*Author's abstract.*

9E–81 551.521.3:551.463:535.4(26

Ivanoff, Alexandre, **Au sujet de la pénétration de la lumière dans la mer.** [Penetration of lig into the sea.] *Académie des Sciences, Paris, Comptes Rendus*, 241(22):1612–1614, Nov. 28, 195 2 figs., 3 refs. **DLC**—Results of measurements of the extinction coefficient of sea water in th entrance of Villefranche harbor and of the relationship between the luminous flux diffused toward the surface and the flux conveyed to the bottom (made with a spectrograph in a water-tight bo

ndled in an autonomous diving apparatus) are presented graphically. It is shown that results vering the extinction coefficient of sea water complete in a satisfactory measure the results obtained Mlle. J. Lenoble in Villefranche Bay and at Monaco at the same period with aid of a spectro- aph obtained in the ultraviolet radiation. *Subject Headings:* **1. Extinction coefficient in sea Light extinction in Mediterranean Sea.**—*A.M.P.*

9E–82 551.46(265)

Japan. Central Meteorological Observatory, Tokyo. Oceanographical Section, **Report of eanographical observations east off Honshu in 1954.** *Japan. Central Meteorological Observatory, okyo, Oceanographical Reports*, 4(1):1–24, June **1955.** 44 figs., 2 tables. In Japanese; English mmary p. 1. **DWB**—In 1954, four seasonal oceanographic stations were occupied by the entral Meteorological Observatory on board the R.M.S. "Ryofū-maru" in the sea area east off onshu. The features and variations of the Kuroshio and Oyashio are analyzed from the stand- oint of physics and chemistry, as well as biology. It is to be noted that a large warm water, cut f from the main Kuroshio stream, was found east of Kinkazan in March. Its development and ecay were pursued, relating to the main stream course. The water mass was of the same property the main Kuroshio, but some difference was found in biological conditions. *Subject Headings:* **Oceanographic observations 2. Honshu Coast, Japan 3. Pacific Ocean.**—*Author's abstract.*

9E–83 551.465

Kobe. Marine Observatory. Oceanographical Section, **Report of the oceanographical ob- rvations south off Honshū in 1954.** *Japan. Central Meteorological Observatory, Tokyo, Ocean- raphical Reports*, 4(1):46-69, June **1955.** numerous figs., 3 tables, eq. In Japanese; English mmary p. 46. **DWB**—In 1954, the oceanographical observations were made in May, Aug. to ept. and Oct. in the southern area off Honshū on board the R.M.S. "Sympu Maru" of the Kobe arine Observatory, and the Central Meteorological Observatory made observation en route to the ean weather station from June to Oct. off Enshū-Nada. The oceanographical conditions of the ea are summarized on these data. 1. In Section two, the hydrographical conditions during each bservation were studied. Through the year, the cold water mass existed off Enshū-Nada and the rrent axis of the Kuroshio was kept aloof from Shionomisaki. Near the coast of Shionomisaki, e westward current was found in Oct.–Dec., and there was a northwestward movement of the cold ater mass. These are the most interesting characteristics in the area. The position and area of e cold water mass fluctuated considerably. The variations of the position of the current axis, e volume transport, etc., off Shionomisaki were investigated. The current velocity and volume ransport were less than those in 1952–53. (In 1952–53, Kuroshio approached the coast off Shio- omisaki.) Off Toisaki, the Kuroshio seemed to approach the coast. 2. Three water masses were nown by the research on the horizontal distributions of dissolved oxygen, phosphate-P and silicate- i. *Subject Headings:* **1. Oceanographic observations 2. Kuroshio Current 3. North Pacific.**— *uthor's abstract.*

9E–84 551.46(265/266)

Koizume, M. (*Met. Res. Inst.*), **Normal values and annual variations of oceanographic elements Researches on the variations of oceanographic conditions in the region of the Ocean Weather tation, "Extra" in the North Pacific Ocean, Pt. 1).** *Papers in Meteorology and Geophysics*, Tokyo, (2):185–201, Sept. **1955.** 10 figs., 7 tables, 9 refs., eqs. **DWB**—Oceanographic data of the Ocean Weather Stations "Extra" (39°N, 153°E) and "Tango" (29°N, 135°E) are treated. "Normal" monthly values, which will be the basis of future investigations, are prepared of some of ocean- graphic elements. Characteristics of the annual variations in the oceanographic elements are iscussed, comparison being made between the two sea regions of the Ocean Weather Stations Extra" and "Tango." Some descriptions are given of spring layers of temperature, chlorinity, nd σ_t and of vertical stability. Besides, numerical values of eddy conductivity are computed by pplying Fjeldstad's method, and some relationships between transparency and color of the sea are xamined. *Subject Headings:* **1. Oceanographic observations 2. North Pacific.**—*Author's abstract.*

9E–85 551.501.4:551.526.6

Kolesnikov, A. G. and Pivovarov, A. A., **Vychislenie sutochnogo khoda temperatury moria po ummarnoĭ radiatsii i temperature vozdukha.** [Computation of diurnal variation of sea temperature rom the total radiation and from air temperature.] *Akademiia Nauk SSSR, Doklady*, 102(2):261–64, **1955.** 2 refs., 22 eqs. **DLC**—The problem of calculating the diurnal temperature variation of ea surface layers on the basis of variations of heat exchange components was first solved by the uthors in **1947.** The formation and solution of this problem was later (1954) revised to conform o a given heat balance variation on the sea surface, and to the more complicated law of radiant nergy absorption by the sea. In this paper the authors change the formulation of the problem in

such a manner that for the computation of diurnal sea temperature regime it will be sufficient t know the diurnal air temperature variation at a certain height, the incoming radiation and surface albedo, and the thermal characteristics of water and air. A theoretical interpretation sho that, by approximating the diurnal variation of temperature deviations by a first harmonic, it easy to establish the correlation between temperature amplitudes of the air and the sea surfa it will be determined only by peculiarities of turbulent exchange in the active atmospheric lay Temperature changes in the sea surface layer precede the changes of air temperature and con quently, changes of the heat balance determine the temperature of the sea surface which, in its tu determines the temperature of the air over the sea. Thus, if its variation is known, it becom possible to re-establish both the temperature variation of the sea surface and the heat balance wh determines the variation of air temperature. *Subject Headings:* **1. Diurnal sea temperature var tions 2. Sea temperature variation computation 3. Air-sea temperature variations 4. H balance.**—*A.M.P.*

9E–86 551.463 551.52

Limbaugh, Conrad and Rechnitzer, Andreas B. (*Scripps Inst. of Oceanog., La Jolla, Cali* **Visual detection of temperature-density discontinuities in water by diving.** *Science*, 121(3142):39 396, March 18, **1955.** fig., 4 refs. **DLC.** Also reprinted as: *California. Univ. Scripps Institut of Oceanography, La Jolla, Contributions, 1955*, issued July **1957.** p. 285–286. **DWB**—The tensive oceanographic observations of the sub-surface physical phenomena conducted at the Scri Institution of Oceanography by skindivers equipped with aqualung are discussed here. Vis detection of thermoclines and water-mass differences were achieved (1) indirectly by the verti distribution of living organisms and suspended particles, (2) by viewing the refractory plane at temperature-density discontinuity, and (3) by the "stream" lines (refraction patterns) due to mixi of water masses of different densities. Instrumental observations, except with the depth ga were not made but are under preparation. *Subject Headings:* **1. Sea water stratification 2. S temperature profiles.**—*W.N.*

9E–87 551.508.91:551.4

Lincoln, John H.; Paquette, Robert G. and Rattray, Maurice, Jr. (*Wash. Univ., Dept. Oceanog.*), **Microsalinometer for oceanographic model studies.** *American Geophysical Uni Transactions*, 36(3):406–412, June **1955.** 6 figs., 3 refs. **DWB**—An instrument has been develo for determining salinity structure in a small-scale oceanographic model of Puget Sound. Variati in electrical conductivity with depth at any point in the model are measured with a small prob conductivity cell. The conductivity-depth diagram is traced by an oscilloscope and photograph Response to changes in conductivity is about 0.05 sec. The present accuracy of measurement about one percent. With suitable modifications the instrument may be adapted to a model almost any scale. Adaptation to use for rapid salinity determination of sea water samples, wh titration accuracy is not required, has been suggested. *Subject Headings:* **1. Microsalinomet 2. Salinity measurement.**—*Authors' abstract.*

9E–88 551.46(265

Maizuru. Marine Observatory. Oceanographical Section, **Report of the oceanographi observations north off San'in and Hokuriku districts in summer, 1954.** *Japan. Central M teorological Observatory, Tokyo, Oceanographical Reports*, 4(1):85–94, June **1955.** 11 figs., tab In Japanese; English summary p. 85. **DWB**—In the summer of 1954, oceanographical observati were carried out on board the R.M.S. "Kuroshio-maru" off San'in and Hokuriku districts in Japan Sea. The results are summarized as follows: (1) The proper cold water was not so act that its upwelling was found off Ajiro and north-eastern area off Oki Island only. (2) The core the warm current, which was at about 100 m depth, flowed closely along the coast as usual, wh its surface warm waters appeared to extend far offshore. (3) Four observations off Kyogamis in about every 10 days showed that the intermediate water of the warm current and the pro water was displaced upwards 50 m. (4) The horizontal distribution of pH of the surface wa showed that the surface layer of the warm current was almost uniform in this region. It is differe from that in the last summer, when the value of pH off shore was smaller than 8.30 in the coas water. (5) From the distribution of the oxygen saturation percentage and silicate-Si, we m say that the proper water upwelled in the continental slope, especially off Ajiro and off Wakasa Ba (6) The dissolved oxygen showed that the upper parts of the proper water originating in the neighb hood of the polar front appeared at 200 m depth about 30 mi off San'in district more extensiv than that in the last year. (For earlier report, *see* 9D–61, April 1958, *MAB.*) *Subject Headin* **1. Oceanographic observations 2. Sea of Japan.**—*Author's abstract.*

9E–89 551.46(26

Mao, Han-Lee and Yoshida, Kozo, **Physical oceanography in the Marshall Islands are Bikini and nearby atolls, Marshall Islands.** *U. S. Geological Survey, Professional Paper*, No. 260-

955. p. 645–684. figs., 179–218, tables, 22 refs. **DGS.** Also issued as *Tokyo. Univ. Geophysical Institute, Geophysical Notes*, 8(2), Contribution No. 29, **1955.** **DLC**—The major features of physical oceanography in the Marshall Islands area are described in separate sections. Owing to the important role played by the system of water circulation in the shaping of other features, discussion of the circulation system is somewhat stressed. In addition to the flow pattern derived from dynamic anomalies, some directly measured current data are included, the large-size horizontal eddies which appear in the boundary zone between the North Equatorial Current and the Equatorial Countercurrent are discussed, and computations of mass transport are made. Distribution of temperature, salinity, density, and temperature-salinity (T-S) relationships are discussed mainly in light of the circulation system and the characteristics and movement of water masses. Only some general remarks are made on the distribution of oxygen because of the scarcity of data available. An outstanding feature which appears to characterize physical oceanography in this area is the unique distribution of all the major properties in the areas of large eddies. It is to be noted that particular attention is always placed on the descriptions and interpretations of these outstanding features in this area of eddies. *Subject Headings:* **1. Temperature-salinity relationships 2. Marshall Islands 3. Western Pacific.**—*Authors' abstract.*

9E–90 551.46(261) 551.526.6(261)

Montgomery, R. B. (*Chesapeake Bay Inst., The Johns Hopkins Univ., Baltimore, Md.*), **Characteristics of surface water at Weather Ship J.** *Deep-Sea Research*, Suppl. to Vol. 3:331–334, **1955.** fig., 10 refs. **DLC**—A temperature-salinity diagram shows the frequency distribution of these elements at Ocean Weather Ship J (latitude 52°–53°N, 18°–20°W) south of Iceland and west of Ireland, for 1948–1950, based on 15 observations a month, or 540 observations in all. The salinity distribution is symmetrical, having a marked peak frequency near the minimum temperature (10–11°C) due to a deep cold persistent mixed layer in winter and a shallow variable summer mixed layer showing slight maxima at around 13° and 14°C. An absolute range of only 7.9°C and range of monthly mean temperature of only 4.5°C was found though the "long range" range was from 8.8°C to 17.8°C (or 10.0°C) according to FRANKCOM (1954) who had the entire record for Ocean Weather Ship J available. *Subject Headings:* **1. Sea surface temperature frequency distribution 2. Ocean Weather station data 3. Ocean Weather Station J, North Atlantic.**—*M.R.*

9E–91 551.464:546.21

Nagai, Masao, **A note on the annual variation of dissolved oxygen in sea water, Pt. 2.** *Oceanographical Society of Japan, Journal*, 11(3):127–132, Oct. **1955.** 2 figs., 2 tables, 6 refs., 8 eqs. In Japanese; English summary p. 127; English legend for figs. and tables. **DWB**—In the present paper, the author has estimated the values of ΔQ_z, considering that the values of super-saturation in dissolved oxygen *in situ* were almost identical to the net production of oxygen by marine organisms. These results have been shown in Table 7 and Figure 5. On these results, the author has concluded that the dominant factor for the seasonal variation of dissolved oxygen may not be the exchange of oxygen across the sea surface (ΔQ_E), but may be the changes of solubility caused by the changes of water temperature. The seasonal variation of dissolved oxygen shows negative correlation, in which the coefficient of correlation is −1.0, with the seasonal variation of water temperature in Gotonada. Thus, the net oxygen production resulting from biological activity is estimated about one-half of the magnitude of variation in dissolved oxygen caused by the changes of solubility. (For Pt. 1, *see* 9E–158.) *Subject Headings:* **1. Sea water composition 2. Oxygen in sea water.**—*Author's abstract.*

9E–92 551.46(265.6) 551.526.6(265.6)

Nagasaki. Marine Observatory. Oceanographical Section, **Report of the oceanographical observations in the Eastern China Sea in winter, 1954.** *Japan. Central Meteorological Observatory, Tokyo, Oceanographical Reports*, 4(1):70–73, June **1955.** 5 figs., 2 tables. In Japanese, English summary, p. 70. Also its: **Report of the oceanographical observations in the Eastern China Sea in summer, 1954.** *Ibid.*, p. 74–84. 13 figs., 2 tables. In Japanese; English summary p. 74. **DWB**—The oceanographical observations were carried out in the Eastern China Sea, mainly Satsunan Sea region, in winter, 1954, by Nagasaki Marine Observatory. In the first paper, the distributions of current, water temperature, and chemical elements are treated, as well as the transports of water mass from the Eastern China Sea to southern coast of Shikoku as the Kuroshio were estimated to be of the order of 16×10^6 m³/sec. The second paper reports the 7th Oceanographical observation in the Eastern China Sea, held by the Nagasaki Marine Observatory on board the R.M.S. "Sympu-Maru" in June-July 1954. In surface layer, the Tsushima current is as strong as in the past summer, and cold water mass near Saisyi-Is., whose center lies about 32.0°N, 125.5°E, developed more than in the last year and expanded to the south-east. Two conspicuous discontinuities were found between the two types of water masses. The axis of the Tsushima current in the summer seems to locate as shown in Fig. 4. By dynamical calculation, the feature of transportation of water mass in

the Kuroshio and the Tsushima current was estimated and indicated in Fig. 6. The energy of the Tsushima current in the summer seems to be larger than that in the annual mean state. *Subject Headings:* **1. Oceanographical observations 2. Sea temperatures 3. China Sea.**—*Author's abstract.*

9E–93 551.463(261,263.4)

*†Noodt, Eberhard, **Temperatur- und Salzgehaltsanomalien in Tiefenhorizonten des Atlantischen Ozeans.** [Temperature and salinity anomalies at deep levels in the Atlantic Ocean.] Thesis (Ph.D.)—Christian-Albrechts-Universität, Kiel, May **1955.** 59 p. 23 figs., 6 charts (fold.), 8 tables, 66 refs. **DWB**—Profiles of temperature, salinity and density of the Atlantic Ocean and large charts of the anomalies of temperature and salinity at 200, 800, 1000 and 2000 m. in the Atlantic and neighboring seas, are presented and analyzed. These are based on the most recent (as well as older) data for the Gulf of Mexico, Barents, Baffin, Norwegian and Southern (Antarctic) Seas, etc., as well as for the main Atlantic (from 80°N to 80°S). A thorough analysis and literature review are included. Local charts for the Gulf of Mexico and Newfoundland Banks, etc., tables of mean latitudinal and depth data and interrelationship between elements are included in analysis. *Subject Headings:* **1. Temperature and salinity anomalies in ocean 2. Oceanographic data analysis 3. Atlantic Ocean 4. Gulf of Mexico.**—*M.R.*

9E–94 551.526.6(265.6):551.524.3

Ogata, T., **On the relation between sea surface temperature and air temperature.** *Journal of Meteorological Research*, Tokyo, 7(3):159–168, March **1955.** 11 figs., table, 7 refs., 4 eqs. In Japanese; English summary p. 159. **DWB**—In general, the interaction between the atmosphere and the ocean is so complicated that it is impossible to separate cause and effect. In this paper the author deals mainly with the relationship between surface sea water temperature and air temperature for the special case when the influence of the weather change on the ocean is considerably small, and a good example for this subject is taken from the observations of ship weather stations at Tango (29°N, 135°E) from June 15 to July 4, 1953 and Point Extra. Main results are as follows: 1. Under the above circumstances, the mean diurnal range of temperature and water temperature is 0.91°C and 0.83°C, respectively. When the weather ship rushed into the cold water mass, whose width is about 50 mi at 38°05′N, 146°15′E on May 5, 1953, the surface water temperature decreased from 15.9°C to 5.4°C and the air temperature at a small distance above the sea surface decreased from 16.0°C to 10.1°C. In this case the author calculated the exchange of heat between the atmosphere and the sea, and obtained the rough coincidence between theoretical and observed values. *Subject Headings:* **1. Air-sea temperature variations 2. China Sea.**—*Author's abstract.*

9E–95 551.526.6(263):639.228

†Postel, E., **Recherches sur l'écologie du thon à nageoires jaunes, *Neothunnus albacora* (LOWE), dans l'Atlantique tropico-oriental.** [Investigations on the ecology of the albacore tuna in the east tropical Atlantic.] *Institut Français d'Afrique Noire, Dakar, Bulletin, Ser. A, Sciences Naturelles*, 18(1):280–318, Jan. **1955.** 24 figs., bibliog. p. 316–318. (Dakar Edition.) **DWB**—Data are presented in graphs, on seasonal variations in temperature at sea at the Pointe des Almadies (Cape Verde) for 1951–2 and 1952–3, and surface water isotherms are shown for various months along Coast of N.W. (Cape Verde region) and of S. Africa (0–20°S) in connection with presence of albacore tuna, which require warm water (temp. >21° at surface, >18° at 50 m depth, and 715°C at 100 m, and salinity of >35/1000 at all levels. Seasonal variations in position of 21° isotherm off Cape Verde are shown on chart. Conditions are compared with those in Pacific. *Subject Headings:* **1. Sea surface temperature data 2. Marine ecology 3. Tuna fishing industry 4. Eastern Tropical Atlantic 5. Cape Verde region.**—*M.R.*

9E–96 551.464(261)

Richards, F. A. and Redfield, A. C., **Oxygen-density relationships in the western North Atlantic.** *Deep-Sea Research*, London, 2(3):182–199, April **1955.** 14 figs., 3 tables, 20 refs. **DWB**—A distinctive correlation between oxygen content and sigma-*t* has been shown to exist in the Sargasso Sea. Waters of the Caribbean Sea, Yucatan Channel and Straits of Florida are anomalously lower in oxygen. Similar oxygen anomalies along the supposed course of the Gulf Stream can be used to delineate its right-hand boundary and to trace water of southern origins to as far as 43°W longitude. The distribution of oxygen anomalies across the Gulf Stream shows that water of southern origins is present in highly variable amounts, that it is present in the various currents and counter-currents, and that these currents are materially related and do not represent merely the transfer of momentum from southern sources. *Subject Headings:* **1. Oxygen-density relationships 2. Sea water composition 3. Western North Atlantic.**—*Authors' abstract.*

9E–97 534:551.463

Smith, Paul Ferris; Richard, Joseph D. and Stephens, Frank H. (*all, Univ. of Miami, Marine Lab.*), **A technique for the spectral analysis of sound in the ocean.** *American Geophysical Union, Transactions*, 36(3):413–418, June **1955.** 10 figs., ref. **DWB**—A method is given for presenting a continuous quantitative spectrum of sound in the ocean. A more detailed spectrum is obtained than from previous methods with the advantage of convenient and rapid operation. The technique has proved useful in the analysis of subsurface oceanic sounds, examples of which are given and will facilitate the analysis of oceanographic noise spectra of meteorological, biological, or volcanic origin. The method is based upon a modification and adaptation of a commercially available heterdyne type sonic analyzer with cathode ray tube presentation. Provisions for photographic recording have been added. *Subject Headings:* **1. Submarine acoustics 2. Sound spectra.**—*Authors' abstract.*

9E–98 551.46.018

Stupishin, A. V., **Vklad russkikh issledovateleĭ v sozdanie gidrologicheskikh priborov.** [Contribution of Russian investigators to the inventions of hydrologic apparatus.] *Priroda*, Moscow, 44(1):76–77, Jan. **1955.** 6 refs. **DLC**—The first bathometer was invented and used by F. F. Bellinghausen during the Antarctic expedition of 1919–1921 and the first apparatus for studying the penetrability of light in water was invented by O. E. Kotzebue in 1815–1818. *Subject Headings:* **1. Bathometers 2. Oceanographic instruments.**—*I.L.D.*

9E–99 551.464

Takano, Kenzɔ, **On the salinity and the velocity distributions off the mouth of a river.** *Tokyo. Univ. Geophysical Institute, Geophysical Notes*, 8(1), Contribution No. 19, June **1955.** 7 p. 3 figs., 4 refs., 35 eqs. **DLC.** Reprinted from *Oceanographic Society of Japan, Tokyo, Journal*, 10(3):92–98, **1954.**—It is shown that the theoretical result of the velocity distribution on the assumption of two-dimensional motion can not account for many observations of salinity off an estuary, even though the effects of Coriolis force and the eddy viscosity supposed to increase with the distance off the shore are taken into account; but the specification of the vertical variation in density gives a considerably different result which may explain actual distributions of salinity. *Subject Headings:* **1. Salinity distribution 2. Velocity distribution 3. Estuaries.**—*Author's abstract.*

9E–100 551.46.018

Thompson, Thomas G. and Chow, Tsaihwa J. (*both, Univ. of Wash.*), **A non-metallic water sampler.** *Deep-Sea Research*, London, 2(3):200–203, April **1955.** 3 figs. (incl. photos), 5 refs. **DWB**—A syringe type water sampler made of Lucite is designed for collecting sea water at any depth without the sample becoming contaminated by contact with the metal. The sampler has been used with success in the investigation of trace metallic ions in the ocean. *Subject Heading:* **1. Sea water samplers.**—*Authors' abstract.*

9E–101 551.46.018 551.461

Vine, Allyn C. (*Woods Hole Oceanog. Inst.*), **Oceanographic instrumentation.** *Science*, Wash., D. C., 122(3173):748–751, Oct. 21, **1955.** 3 refs. **DLC**—The general problem of oceanographic instrumentation is discussed and several specific aspects, together with novel instruments devised for the special problems encountered on oceanographic expeditions, elaborated on. The research vessel itself, temperature and salinity measurement equipment, current measurements, acoustic measurements, underwater photography, bathymetry, pressure vessels, and unsolved problems are among the items considered. A buoy that can sink to the ocean bottom and come back up with recordings is an advance over the cable method used for nearly 100 years. *Subject Headings:* **1. Oceanographic instruments 2. Oceanographic research.**—*M.R.*

9E–102 551.526.6:551.524.4(265)

Watanabe, Nobuo (*Oceanog. Section, Tokai Regional Fisheries Res. Lab.*), **On the temperature change in the upper layer in summer, (Hydrographic conditions of the north-western Pacific, Pt. 1).** *Oceanographical Society of Japan, Journal*, 11(3):111–122, Oct. **1955.** 10 figs., 3 tables+table in appendix, 6 refs., 4 eqs. **DWB**—On the basis of the data obtained during the oceanographic observations carried out in the adjacent sea to the western Aleutian Islands in the early summer of 1953, the author has studied the mechanisms of temperature change in the surface layer, considering the heat exchange between the sea and the atmosphere and the heat transportation due to water movements and mixing. As a result of it, the following conclusions have been deduced. (1) As the factors contributing to the variation of the surface temperature, the heat exchange between sea water and atmosphere above the sea surface, eddy conductivity, advection and vertical water movement should be taken into consideration. (2) Although the magnitudes of advection, vertical eddy and vertical motion of water masses did not distribute always uniformly among the different stations

in the area under study, the magnitudes of heat transportation, owing to these factors and heat radiation received at the sea surface, were frequently of the same order. Further, sea fog formed within the area under study has been considered as an important factor for the appearance of oceanographic conditions in summer, contributing the transportation of heat to the sea surface. *Subject Headings:* **1. Sea surface temperature variations 2. Heat exchange sea-atmosphere 3. Northwest Pacific.**—*Author's abstract.*

9E–103 551.464:91.04

*Wüst, Georg and Brogmus, Willi, **Ozeanographische Ergebnisse einer Untersuchungsfahrt mit Forschungskutter "Südful" durch die Ostsee Juni/Juli 1954, anlässlich der totalen Sonnenfinsterniss auf Öland.** [Oceanographic results of a research trip with the "Südfall" cutter through the Baltic Sea, June/July 1954, on the occasion of the total eclipse at Öland.] *Kieler Meeresforschungen*, Kiel, 11(1):3–21, **1955.** 9 figs. (some fold.), 4 tables, 15 refs. **DWB**—The expedition was for the purpose of making astrophysical observations during the eclipse and oceanographic observations on the voyage. Twenty stations were occupied between the eclipse observation point at 57°25.5′N, 17°40′E in the West Gotland Basin and Kiel from June 30 to July 3, 1954. Temperatures, salinity, density and O_2 concentration from 0 to 100 m are tabulated for each station, cross sections are drawn and equipment, methods, etc., described and illustrated in detail. *Subject Headings:* **1. Oceanographic expeditions 2. Oceanographic cross-sections 3. Ocean temperatures 3. "Südfall" Expedition, 1954 4. Baltic.**—*M.R.*

1956

9E–104 551.463(265)

Abe, Tomosaburo (*Met. Res. Inst., Tokyo*), **A tentative analysis of wind wave data in view of the foaming of sea water, Pt. 2 (Study on the foaming of sea water).** *Papers in Meteorology and Geophysics*, Tokyo, 7(2):136–143, July **1956.** 21 figs., 4 tables, 4 refs., 6 eqs. **DWB**—The present author treated tentatively the relation between the wind speeds in the wind wave scale 3 and the surface water temperatures in an open sea, using the data of oceanographic observations taken at the Ocean Weather Station "X" (39°N, 153°E) in the North Pacific Ocean in view of the foaming of sea water, and the following results were obtained: (1) The general features of the frequency distribution of wind speeds in the wind wave scale 3 were discussed; (2) He defined a quantity R_0 which is physically significant, in order to discriminate the degree of foaming in actual seas how often the white-caps appear, where 0 represents the degree of surface water temperature. Using its values calculated from oceanographical data, he could ascertain that the higher the surface water temperature becomes, the lower the degree of foaming of sea water. This relationship coincided fairly well with the results of his previous report (*see* 9E–66). *Subject Headings:* **1. Foam layer of sea water 2. North Pacific.**—*Author's abstract.*

9E–105 551.464

*Barnes, Clifford A. and Collias, Eugene E., **Physical and chemical data for Puget Sound and approaches, Jan./Dec. 1953.** Washington (State). Univ. Dept. of Oceanography, Contract N8onr-520/III; Contract Nonr-477(10); Contract Nonr-477(01), Technical Report, No. 45, March **1956.** 212 p. numerous figs., almost entirely tables, 8 refs. **DWB**—This report tabulates physical and chemical observations made at various locations in Puget Sound and approaches by the Dept. of Oceanography of the Univ. of Washington on the research vessels "Brown Bear" and "Oncorhynchus." The observations were made at approximately 55 locations at monthly intervals during the period Jan. through Dec. 1953. Charts show the positions of the stations sampled. Values are given for temperature, salinity, dissolved oxygen and dissolved inorganic phosphate over a range of depths from the surface to the bottom as determined, using accepted oceanographic techniques. *Subject Headings:* **1. Oceanographic chemistry 2. Ocean temperatures 3. Salinity 4. Puget Sound.**—*Authors' abstract.*

9E–106 591.9:551.46

Bruun, Anton Fr., **The abyssal fauna: its ecology, distribution and origin.** *Nature*, London, 177(4520):1105–1108, June 16, **1956.** 2 figs., 10 refs. **DWB**—The ocean is divided into thermosphere and psychrosphere, the latter including bathyal, abyssal and hadal zones. Differences of temperature, composition and pressure are set out. The vertical and horizontal distribution of fauna, its origin and the effect of rapid cooling at the end of the Tertiary are discussed. *Subject Headings:* **1. Marine fauna 2. Ocean depths.**—*C.E.P.B.*

9E–107 535.4:551.46

Burt, Wayne V. (*Oregon State College, Corvallis*), **A light-scattering diagram.** *Journal of Marine Research*, New Haven, Conn., 15(1):76–80, Oct. **1956,** fig., 11 refs. **DWB, DLC**—A diagram is

presented which shows the light scattering effectiveness of small particles when they are suspended in water. The effective scattering is plotted as a function of the radius of particles (0.005 to 5μ), of the wave length of the energy being scattered (0.35 to 0.8μ), and of the relative refractive index of the material in the particle when compared to water (1.02 to 1.40). The diagram covers the range of variables for most fine materials which are found suspended in natural waters. *Subject Heading:* **1. Scattering of light.**—*Author's abstract.*

9E–108 551.465

*Chew, Frank and Wagner, Lansing P., **Semi-annual report of investigation between the period of May 15 and Nov. 15, 1955.** Miami, Univ. of [Coral Gables, Florida]. Marine Laboratory, Contract Nonr 840(01), Technical Report [unnumbered], May **1956.** 40 p. 36 figs., tables, 13 refs., eqs. **DWB**—Report contains data and charts derived from oceanographic or hydrographic cruises in the Cay Sal Bank region in the Florida Straits. Bathythermograms, temperatures in July 1953 and Aug. 1955, current velocities, flow patterns, water transport, volume and heat transport, oxygen distribution, and salinity are among subjects of charts and text. On p. 19–28 an article by Frank Chew discusses the possible role of inertial transverse motion on the dynamics of the Florida current. *Subject Headings:* **1. Oceanographic cruise data 2. Dynamics of Florida current 3. Florida Straits.**—*M.R.*

9E–109 551.46

Fel'zenbaum, A. I., **O baroklinnom sloe v more.** [Baroclinic layer in the sea.] *Meteorologiia i Gidrologiia, Leningrad*, No. 1:19–24, Jan. **1956.** 2 figs., 3 refs., 19 eqs. **DWB, DLC**—The study of the relationship among wind, density distribution, water level and current velocity under actual conditions is rendered difficult owing to the complexity of the phenomena and inadequacy of instrumentation; hence, these relationships are examined on the basis of a theoretical model involving an infinite cause and determining the distribution of density, current velocity caused by winds directed along the axis and varying only along the cross sections in the cross-sectional direction of the canal. The mathematical-theoretical treatment proceeds by considering sea water as an incompressible, heterogeneous fluid and attempts to determine theoretically the depth of wind penetration. *Subject Heading:* **1. Baroclinic layer in sea.**—*I.L.D.*

9E–110 551.46.018

Hinkelmann, H., **Ein Gerät zur Schnellregistrierung des Druckes, der Temperatur und des Salzgehaltes für Anwendungen in der Ozeanographie.** [An apparatus for rapid recording of pressure, temperature, and salinity for oceanographic applications.] *Kieler Meeresforschungen*, Kiel, 12(2):200–201, **1956.** photo. **DWB**—Oceanographic measurements must be accurate, the equipment must respond rapidly and must function at great depth. Such a bathysonde has been devised. Equipment is described briefly and illustrated. It was developed at the Institute for Applied Physics and the Institute for Oceanography, of the University of Kiel. Fuller work is to be published in *Zeit. für Angewandte Physik*. *Subject Heading:* **1. Oceanographic sounding equipment.**—*M.R.*

9E–111 551.464:546.13(265)

Ichiye, Takashi (*Oceanographical Section, Central Met. Obs., Tokyo*), **On the annual variation of chlorinities at the upper layer of the Kuroshio.** *Oceanographical Magazine*, Tokyo, 7(2):87–93, Feb. **1956.** 7 figs., 5 refs., 3 eqs. **DWB, DLC**—The chlorinities at the upper 50 m depth of the Kuroshio are averaged from the data of 1931 to 1941, and the harmonic components of annual cycle are determined, which indicate the similar pattern to the current condition of the Kuroshio. The distributions of these components are explained by the combined effect of the lateral mixing of the waters from both sides and the advective effect of the Kuroshio from the source region considered to be near the Nansei-shotō Islands. *Subject Headings:* **1. Chlorinity 2. Kuroshio Current 3. North Pacific.**—*Author's abstract.*

9E–112 551.46.018

Ishiguro, Shizuwo; Fujiki, Akimitsu and Nagata, Mitsukazu, **An electronic measuring apparatus for sea wave pressure, type 6.** *Oceanography and Meteorology*, Nagasaki, Japan, 7(1/4): Paper No. 7, June **1956.** 8 figs., (incl. photo), table, 8 refs. In Japanese; English summary p. 1. **DWB**—The authors have designed several measuring apparatus for sea wave pressure since 1948. The type-6 apparatus, described in the present report, is designed according to a particular specification and is very simplified. As shown in the block diagram of system (Fig. 1), a stabilized 50 c/s a-c voltage is directly used for a carrier wave and fed to a transducer combined with a pressure gage. The transducer devised by M. J. Tucker (1950) is used to modulate the amplitude of carrier wave. The modulated carrier wave is amplified and demodulated by a metal rectifier, and the output current is supplied to a direct reading indicator or a recorder. The measuring range of pressure is

changeable to two stages; 0–7 ton/m² and 0–14 ton/m², and the accuracy of both stages is about ±5% of each maximum value for the wave period of more than ½ sec., approximately, under the condition of fluctuations of power supply voltage, 90–110 volts. *Subject Headings:* **1. Wave pressure measuring device 2. Tucker transducer.**—*Authors' abstract.*

9E–113 551.46.018

Ishiguro, Shizuwo, **An electronic recorder for sea wave pressure, type 3.** *Oceanography and Meteorology*, Nagasaki, Japan, 7(1/4):Paper No. 6, June **1956.** 5 figs. (incl. photos), 5 refs., 6 eqs. In Japanese; English summary p. 1. **DWB**—The author reported on the electronic recorders for sea wave pressure in 1948 and 1949. The type-3 recorder, described in the present paper, is an improved type of the forementioned recorders. The apparatus consists of three parts: (1) a pressure gage having a variable reluctance type transducer for amplitude moduiation; (2) a recording part containing a 440 c/s carrier wave oscillator, an amplifier, a metal demodulator and a direct inking oscillograph; and (3) a power supply driven by a 100 v 60 c/s a-c line or a 12 v d-c battery. The measuring ranges of pressure are changeable by the exchange of spiral spring of the gage. The accuracy of measuring pressure is about ±3% of each maximum value in any amplitude range and in the frequency range of less than 14 c/s. The pressure amplitudes are recorded on a paper 40 mm wide with the time signals sent from a chronometer. The type-3 recorder has been improved especially in the frequency response, the electrical stabilities and the portability of apparatus. *Subject Headings:* **1. Electronic recorders 2. Sea wave pressure measurement.**—*Author's abstract.*

9E–114 535:551.463

Ivanoff, Alexandre, **Au sujet du facteur de polarisation du résidu sous-marin de lumière du jour, dans la région de Roscoff.** [Degree of polarization of residual submarine daylight in the region of Roscoff.] *Académie des Sciences, Paris, Comptes Rendus*, 243(18):1345–1348, Oct. 29, **1956.** tables, 4 refs. Also his: **Au sujet du facteur de polarisation du résidu sous-marin de lumière du jour, sur la côte ouest de la Corse.** [On the polarization factor of residual submarine daylight at the west coast of Corsica.] *Ibid.*, 243(19):1430–1432, Nov. 5, **1956.** 6 refs., eq. Also his: **Au sujet des propriétés optiques de l'eau de mer à Roscoff et en Corse.** [Optical properties of sea water at Roscoff and in Corsica.] *Ibid.*, 243(20):1543–1545, Nov. 12, **1956.** fig., 6 refs. Also his: **Contribution à l'étude des propriétés optiques de l'eau de mer en Bretagne et en Corse, et à la théorie de la polarisation sous-marine.** [Contribution to the study of the optical properties of sea water in Brittany and Corsica and to the theory of underwater polarization.] *Annales de Géophysique*, Paris, 13(1):22–53, Jan./Feb. **1957.** 18 figs., 19 refs., 3 eqs. English summary p. 22–23. **DLC**—At the west coast of Corsica the extinction coefficient of sea water differs only slightly from that of clearest ocean water. At Roscoff it is higher by a factor of the order of only 1.15 for wave lengths above 550 mμ but increasing rapidly in blue and violet, where it exceeds 4.5. The polarization of submarine daylight has its maximum in the direction normal to the apparent direction of the sun inside the sea. In the turbid waters of the Roscoff area the degree of submarine polarization reaches 20% with overcast sky and about 30% with blue sky at small depth. In the Corsican waters the degree of polarization is as much as 60% with blue sky at small depth. *Subject Headings:* **1. Optical properties of sea water 2. Roscoff, France 3. Corsica.**—*From author's abstracts.*

9E–115 535.5:551.463

Ivanoff, Alexandre (*Muséum National d'Histoire Naturelle, Paris*), **Degree of polarization of submarine illumination.** *Optical Society of America, Journal*, 46(5):362, May **1956.** 3 figs., table, ref. **DWB, DLC**—The degree of polarization of submarine illumination has been measured by photographing the interference lines given by a Savart plate, and evaluating their contrast factor. The results given in a table were obtained during Sept. 1955 at about noon on the French Mediterranean shore in a depth of 20 m. They show that polarization of submarine illumination may reach significant values in some directions. The major part of the polarization is probably due to scattering by particulate matter in the sea. *Subject Headings:* **1. Polarization of submarine illumination 2. Mediterranean Sea.**—*From author's abstract.*

9E–116 551.5:551.46

*Japan. Central Meteorological Observatory, Tokyo, **The NORPAC expeditions.** Its *Results of Marine Meteorological and Oceanographical Observations*, No. 17 (Special Number), July/Sept. **1955.** Issued Jan. **1956.** 131 p. Almost entirely tables. **DWB, DLC**—Data collected by three research vessels south of Hokkaido, east and south of Honshu, and in the East China Sea in July–Sept. 1955 are tabulated. The extensive tables include values of atmospheric temperature, wind velocity, wind wave, swell, water temperature, currents, chemical composition, transparency, water color, plankton, etc. Participating agencies were the Central Meteorological Observatory and the Hakodate, Kobe and Nagasaki Marine observatories. *Subject Headings:* **1. Oceanographic data 2. Sea of Japan 3. China Sea.**—*G.T.*

9E–117 551.5:551.46

*Japan. Central Meteorological Observatory, Tokyo, **Results of Marine Meteorological and Oceanographical Observations, Pt. 2, Maritime Meteorology, No. 12/18, July 1950–Dec. 1955,** pub. June **1956.** 193 p. almost entirely tables. "Beginning No. 12, July/Dec. 1952, the Results have been issued in two parts, Pt. 1, Oceanography and Pt. 2, Maritime Meteorology. Beginning with No. 19, Pt. 2, will be published half-yearly as Pt. 1." **DWB**—Detailed marine meteorological observations for a number of ships operating in Japanese waters are given for 39 areas for year 1950–1955. The oceanographic observations for the same cruises have been published as Pt. I of No. 12–18, 1952–55. This volume includes pressure, air temperature, dewpoint, wind, cloud visibility, waves, swell, weather, sea surface temp., and chlorinity at ½ hourly, hourly, or 3-hourly intervals throughout voyage. *Subject Headings:* **1. Oceanographic data 2. Oceanographic cruises 3. Japanese seas.**—*M.R.*

9E–118 551.5:551.46

Koizumi, M. (*Met. Res. Inst., Tokyo*), **Air temperature, sea-surface temperature, and wind. (Researches on the variations of oceanographic conditions in the region of the ocean weather station "Extra" in the North Pacific Ocean, Pt. 2).** *Papers in Meteorology and Geophysics,* Tokyo, 6(3/4): 261–272, Jan. **1956.** 9 figs., 3 tables, 8 refs. . . . Also, **Pt. 3: The variation of hydrographic conditions discussed from the heat balance point of view and the heat exchange between sea and atmosphere.** p. 273–284. 5 figs., 2 tables, 21 refs., 11 eqs. **DWB**—The present investigation is based upon the data observed at the Ocean Weather Stations "Extra" (39°N, 153°E) and "Tango" (29°N, 135°E) from March 1948 to Nov. 1953. Notable features of the annual variations of the air and the sea-surface temperatures and the wind are described, the comparison being made between the two stations. Some relationships between those elements are examined. It is found that a very high correlation exists between the air and the sea-surface temperature anomalies during the warm season (from May to Oct.). In Pt. 3, the author investigates the variation of hydrographic conditions in the sea region of Ocean Weather Station "Extra" (39°N, 153°E) from the standpoint of heat balance. The heat exchange between sea and atmosphere also is examined for the same region. The main results obtained are summarized as follows: 1) The evaporation from the sea surface, the "Bowen ratio," the sensible heat given to the atmosphere, and the total energy loss from the sea surface have all a similar type of seasonal variation, with larger values in winter and smaller ones in summer. 2) On an annual average, the amount of heat brought into the region of Sta. "Extra" by ocean currents is comparable to the amount of heat used for evaporation, which is about twice as large as the effective radiation and plays the most important part in the heat balance. Of course, the relations are different for the seasonal and the monthly values. 3) Sta. "Extra," when compared with another Ocean Weather Station "Tango" (29°N, 135°E) on the sea adjacent to Japan, it is characterized, in general, by a little lower evaporation, much greater sensible heat exchange, and, in annual mean, greater total energy exchange. 4) The most important conclusion as to the seasonal variation of hydrographic conditions is that the Kuroshio water is ordinarily prevalent in the region of Sta. "Extra" from spring to autumn, while in winter a water mass of Oyashio origin predominantly flows into this region. *Subject Headings:* **1. Energy exchange ocean-atmosphere 2. Ocean weather stations 3. North Pacific.**—*Author's abstract.*

9E–119 551.526.6:551.46

Koizumi, M. (*Met. Research Inst., Japan*), **On the diurnal variations in air and sea-surface temperatures (Researches on the variations of oceanographic conditions in the region of the Ocean Weather Station "Extra" in the North Pacific Ocean, Pt. 4).** *Papers in Meteorology and Geophysics,* Tokyo, 7(2):144–154, July **1956.** 5 figs., 2 tables, 4 refs. eq. **DWB**—The data used are of air and sea-surface temperatures observed every three hours at the Ocean Weather Stations "Extra" (39°N, 153°E) and "Tango" (29°N, 135°E). Average diurnal variations of air and sea-surface temperatures are examined for every month of the year. It is noticed that the diurnal variation of air temperature at both stations presents a characteristic curve with a swelling in the forenoon. Seasonal changes are examined of characteristic parameters of diurnal variations, e.g., the range, the time of occurrence of extreme values, the time of occurrence of the values equal to the diurnal mean, etc. Diurnal variation of the temperature difference between the air and the sea surface is shown at the end. *Subject Headings:* **1. Sea surface temperature variations 2. Ocean Weather Station "Extra" 3. North Pacific.**—*Author's abstract.*

9E–120 551.526.6:551.46

Koizumi, M. (*Met. Research Institute*), **On a short-periodic variation of sea-surface temperature (Researches on the variations of oceanographic conditions in the region of the Ocean Weather Station "Extra" in the North Pacific Ocean, Pt. 5).** *Papers in Meteorology and Geophysics,* Tokyo, 7(2):155–160, July **1956.** 4 figs., table, 4 refs., eqs. **DWB**—On plotting the daily means of sea-

surface temperature at Ocean Weather Station "Extra" (39°N, 153°E) against time, we find that there are oscillations of the temperature with periods of about ten days. The periods of these temperature oscillations were determined. Among possible causes for these oscillations, the meandering of ocean currents may be mentioned as the most probable one. *Subject Headings:* **1. Sea surface temperature variations 2. Ocean Weather Station "Extra" 3. North Pacific.**—*Author's abstract.*

9E–121 535.4:551.463

Lenoble, J., **Angular distribution of submarine daylight in deep water.** *Nature*, London, 178(4536):756–757, Oct. 6, **1956.** 2 figs., table, 4 refs. **DWB**—POOLE's assumption of isotropic scattering of light by sea water is replaced by one of a large forward scattering, which gives much better agreement with observations. (*Same item as* 8.1–71, Jan. 1957, *MAB.*) *Subject Heading:* **1. Light scattering in sea.**—*C.E.P.B.*

9E–122 551.521.17:551.463

Lenoble, Jacqueline (*Lab. de Physique du Muséum*), **Étude de la pénétration de l'ultraviolet dans la mer: nouvelles mesures.** [Study of ultraviolet penetration in the sea: new measurements.] *Annales de Géophysique*, Paris, 12(1):16–31, Jan./March **1956.** 10 figs. (incl. photos), 2 tables, 9 refs., eqs. English summary p. 16. **DLC**—A new apparatus for the study of the penetration of ultraviolet radiation in the sea and the possible errors in these measurements at sea are discussed and the results of experiments made this summer in the Mediterranean sea near Monaco presented. These results are in good agreement with the preceding ones. The radiation going vertically downwards is reduced at $\frac{1}{10}$ of its surface value near 30 m of depth for 4000 Å, and near 10 m for 3200 Å. The proportion of radiation scattered horizontally and vertically upwards is nearly constant in depth, decreases a little in the short wavelengths and is much variable from one day to another; the mean values, for the middle of the ultraviolet spectrum, are approximately 20% and 2% of the downwards radiation. These results are explained by the theoretical computations of CHANDRASEKHAR. *Subject Headings:* **1. Ultraviolet radiation penetration into sea 2. Mediterranean Sea.**—*Author's abstract.*

9E–123 535.66:551.463

Lenoble, Jacqueline, **Remarque sur la couleur de la mer.** [Note on the color of the sea.] *Académie des Sciences, Paris, Comptes Rendus*, 242(5):662–664, Jan. 30, **1956.** fig., table, 6 refs. **DLC**—CHANDRASEKHAR's method is applied to the calculation of the color of an infinite sea illuminated by a uniformly white sky. It is shown that a sea of distilled water, with a nonselective diffusion, would be blue. For clear water the prevailing wavelength is 480 mμ and the fairly variable purity increases with decreasing angle of observation. *Subject Heading:* **1. Sea color.**—*Trans. of author's abstract.*

9E–124 551.521.17:551.46

Lenoble, Jacqueline, **Sur la pénétration du rayonnement ultraviolet dans les eaux côtières de Bretagne.** [Penetration of ultraviolet radiation in the coast waters of Bretagne.] *Académie des Sciences, Paris, Comptes Rendus*, 243(7):668–672, Aug. 13, **1956.** 2 tables, 4 refs. **DLC**—Results of measurements of the penetration of natural ultraviolet radiation in the coast waters of Bretagne carried out by photographic spectrometry at Dinard (May 1955), Concarneau and Roscoff (July 1956) show that the coefficient of extinction there is from four to seven times larger than it is at Monaco (mean values obtained in 1953–1954 and 1955). On the other hand, the absorption spectrum is sensibly equivalent, and the spatial distribution of diffused radiance of Bretagne waters is of the same order as at Monaco. *Subject Headings:* **1. Ultraviolet radiation penetration into sea 2. Brittany, France.**—*A.M.P.*

9E–125 551.521.17:551.46

Lenoble, Jacqueline, **Sur la pénétration du rayonnement ultraviolet dans les eaux méditerranéenes.** [Penetration of ultraviolet radiation in Mediterranean waters.] *Académie des Sciences, Paris, Comptes Rendus*, 243(22):1781–1783, Nov. 26, **1956.** table, 5 refs. **DLC**—Measurements of UV light penetration in the sea off the west coast of Corsica gave extinction coefficients of the same order of magnitude as near the French coast at Monaco for downward propagation, but markedly smaller relations of upward to downward and horizontal to downward extinction. Halfway between the two coasts, the open water has a somewhat stronger extinction. *Subject Headings:* **1. Ultraviolet radiation penetration into sea 2. Radiation measurements 3. Mediterranean Sea.**—*Trans. of author's abstract.*

9E–126 551.521.17:551.521.3:551.463

Lenoble, Jacqueline, **Sur le rôle des principaux sels dans l'absorption ultraviolette de l'eau de mer.** [The role of the principal salts in the ultraviolet absorption by sea water.] *Académie des*

Sciences, Paris, Comptes Rendus, 242(6):806–808, Feb. 6, **1956.** table, 4 refs. **DLC**—Spectrophotometric measurements of transmission through concentrated salt solutions were made under laboratory conditions. The measurements involved nine salts occurring in sea water, at sixteen wavelengths from 2500 to 4000 Å. Absorption values converted to the natural sea-water concentration of each salt are tabulated. Absorption due to salt in a 25 m column of sea water is found to be $\frac{1}{2}$ to $\frac{3}{4}$ of the absorption by a 25 m column of pure water. *Subject Headings:* **1. Ultraviolet radiation absorption through salt solutions 2. Laboratory experiments.**—*G.T.*

9E–127 551.46(521.44)

Nakayama, I., **On the influence of the river water on oceanographical condition in the western part of Wakasa Bay.** *Journal of Meteorological Research*, Tokyo, 8(7):422–424, Aug. **1956.** 3 figs., 3 refs. In Japanese, English summary, p. 422. **DWB, DLC**—The oceanographical condition in the western part of Wakasa Bay in the Sea of Japan is greatly influenced by the water flowing in from the Yura River. The author investigated the general tendency of this influence, using the data of surface chlorinity and transparency obtained by the Maizuru Marine Observatory and the Fisheries Experimental Station of Kyoto-Fu between April 1952 and March 1954. For the present consideration, the extinction coefficient of light μ is computed from transparency by the following formula:

$$\mu = 1.8\ T^{-1},$$

where T is transparency. The distribution of the mean value and standard deviation of surface chlorinity and extinction coefficient of light are shown in figs. From these figures, it is seen that the influence of water from the Yura River is remarkable, as far as a line connecting Musogahana and Bakuchi-Misaki about 3 mi north of the river, and extends as far as Naryu-Zaki. The distribution of extinction coefficients of light shows the influence of river water more distinctly than that of chlorinity in this investigation, and so it is preferable to measure directly the extinction of light in the future. *Subject Headings:* **1. River flow 2. River discharges 3. Extinction coefficient 4. Wakasa Bay, Japan.**—*Author's abstract.*

9E–128 551.526.6(265.4)

Nakayama, I., **On the variations of water temperature in the Sea of Japan.** *Journal of Meteorological Research*, Tokyo, 8(6):360–364, July **1956.** 5 figs., table, 9 refs. In Japanese; English summary p. 360. **DWB, DLC**—Large variations of water temperature in the transition layers between the warm Tsushima Current and the surrounding cold water were found 30 mi. north of Kyoga-Misaki in three observations carried out by the Maizuru Marine Observatory in the summer of 1952. *Subject Headings:* **1. Sea temperature variations 2. Sea of Japan.**—*From author's abstract.*

9E–129 551.46:06(082.1)

National Institute of Oceanography, Wormley, Surrey, England, **Collected Reprints, Vol. 4 (No. 125–162), Dec. 1956.** 38 reprints (of 1955 and 1956 imprint) in original format. **DWB**—These reprints from numerous scientific (and fisheries) journals are bound together in one volume. Articles are by G. E. R. Deacon, J. N. Carruthers, H. Charnock, J. E. Cartwright, and other members of the Institute. Over half the papers are on currents, wave and other aspects of physical oceanography. The remainder are on marine biology. Previous collections (Vol. 1, 2 and 3) containing 124 reprints are similarly proportioned. Individual articles of concern to meteorologists are abstracted and published separately. (*See* 6.10–4 for overall on Vol. 1.) For list of contents of Vol. 4, *see* Pt. III of this issue. *Subject Heading:* **1. Oceanographic reprint collections.**—*M.R.*

9E–130 546.791:551.464

Rona, Elizabeth; Gilpatrick, L. O. and Jeffrey, Lela M., **Uranium determination in sea water.** *American Geophysical Union, Transactions*, 37(6):697–701, Dec. **1956.** fig., 3 tables, 18 refs., 3 eqs. **DWB, DLC**—Uranium analyses of sea-water samples taken from different locations were carried out by the isotope-dilution method. Uranium was separated by liquid-liquid extraction from 2000 ml of sea water, for each determination. The small residue of uranium resulting from the chemical separation was analyzed by mounting it on a tantalum filament and examining the UO_2^+ thermal ions in a Nier six-inch radius, 60° sector-type mass spectrometer. The results show a concentration of 3.1 to 3.5 micrograms of uranium per kilogram of sea water, with a uranium/salinity ratio of 9.0 to 9.8 10^{-8}. *Subject Headings:* **1. Sea water composition 2. Uranium in sea water.**—*Authors' abstract.*

9E–131 551.464(262.54)

Shekhtman, A. N., **Solenost' vody Azovskogo moria pri izmenii ego vodnogo balansa.** [Salinity of the Sea of Azov during change in its water balance.] *Meteorologiia i Gidrologiia*, Moscow, No.

8:14–19, Aug. **1956.** 2 figs., 5 refs., eq. **DWB, DLC**—In connection with the annual removal o about 30% of the annual inflow into the Sea of Azov by the use of water from the Don River fo the Tsimliansk reservoir, etc., and the consequent increase in the salinity of the Sea of Azov, the author examines the available data on the water and salinity regime of the sea and the calculation of the water exchange in the Kerch Strait. An equation for the water balance in the Kerch Strait is presented and with its aid both the change in the salinity of the Sea of Azov and its maintenance can be determined. It is concluded that with the decrease in river flow by 13.5 km³/year, the salinity of the Sea of Azov will attain 14.8%. The most radical means for preventing this increased salinity is to build a dam in the Kerch Strait which would reduce the water exchange fourfold. *Subject Headings:* **1. Salinity 2. Kerch Strait 3. Sea of Azov.**—*I.L.D.*

9E–132 551.465

·*Snellius-Expedition, 1929–1930, **Snellius Expedition in the eastern part of the East Indian Archipelago, 1929–1930 under leadership of P. M. Van Riel, Vol. 2, Oceanographic Results, Pt. 5: The bottom water, Ch. 2, Temperature,** by P. M. Van Riel. Leiden, E. J. Brill, **1956.** 60 p. 35 figs., 8 plates (in pocket), 15 tables, 25 refs. List of publications concerning the "Snellius Expedition" (until 1956), p. 56–58. **DWB**—An elaborate monograph, giving an analysis, in the same form as previous "Snellius" Expedition Reports, of the scientific observations (with graphs, cross sections, charts and tables) of temperature below 6 mm depth (surface water temperature data were analyzed in Vol. II, Pt. 4, by S. W. Visser in 1938, and meteorological data in Vol. III, 1936). The cruise covered the Banda Islands, Makassar, Celebes and adjacent seas in a very thorough manner. (*See also* 5A–75, Jan. 1954, *MAB.*) *Subject Headings:* **1. Oceanographic cruises 2. Bottom water temperatures 3. "Snellius" Expedition, 1929–1930 4. East Indian seas. I. Van Riel, P. M.**—*M.R.*

9E–133 551.46:551.311.181(268)

Sverdrup, Harald U., **Oceanography of the Arctic.** (In **Dynamic North.** Wash., D. C., Technical Assistant to Chief of Naval Operations for Polar Projects, **1956.** Vol. 1, Pt. 5. looseleaf. 32 p. 4 figs., 19 refs.) **DWB**—A systematic treatment of the oceanography of the various parts of the Arctic Ocean and bordering seas. The 12 main chapters cover: 1) The Labrador Sea, 2) Baffin Bay, 3) Hudson Bay and Strait, 4) Northwest Passage, 5) Beaufort Sea, 6) Chukchee Sea, 7) East Siberian Sea, 8) Laptev Sea, 9) Kara Sea, 10) Barents Sea, 11) Norwegian or Greenland Sea, and 12) the Polar Sea proper. Under each section the bathymetry, bottom sediments, salinity, temperature, density, oxygen content, currents, wind drift and ice conditions are discussed where appropriate, sometimes at greater length and sometimes briefly, with whatever data can be found to support the general picture. (*See also* 5I–191, Sept. 1954, *MAB.*) *Subject Headings:* **1. Arctic oceanography 2. Arctic Ocean.**—*M.R.*

9E–134 551.526.6(265/6)

*U. S. Coast and Geodetic Survey, **Surface water temperatures at tide stations, Pacific Coast, North and South America and Pacific Ocean islands.** Its *Special Publication*, No. 280, 5th ed., with data through 1955, issued **1956.** 74 p. Mostly tables. **DWB** (M26.6 U582sp) (for 1952 ed., *see* 4I–260, Sept. 1953, *MAB*).—Mean monthly water (bucket) temps. made from daily readings at 127 stations in the Pacific area (mainly at U. S. tide stations) for period from beginning of record through 1955. Graphs show annual curve of mean sea surface temp. at 64 stations. Map shows location of each station. A nice coverage of the Aleutians, Alaska, U. S., Mexico, Central America and the West Coast of S. America as well as the Pacific islands and the Philippines is represented. Range of temps. each month are given for Friday Harbor, Wash., and Avila Beach, Calif. *Subject Headings:* **1. Sea temperature data 2. Pacific Coast, U. S. 3. Pacific Ocean area.**—*M.R.*

9E–135 551.46(02)

U. S. Hydrographic Office, **Instruction manual for oceanographic observations.** 2d ed., 1955. Its *H. O. Publication*, No. 607, **1956.** 210 p. forms, figs., photos., tables. Price: $12.00. **DLC**—A large, well illustrated instruction manual for all types of oceanographic work at sea: equipment and instruments are described, sampling and thermometer readings, temperature and depth calculations, drawing graphs and profiles, navigation and sonic soundings, bottom sampling and dredging, undersea photography, biological sampling, current measurements, sea and swell observations, meteorological observations (Ch. 11, p. 110–113) transparency and light absorption, chemistry, recording and log sheets, and bibliography occupy separate chapters. In the appendix the oceanographic and meteorological codes used at sea, and necessary conversion tables, are found on p. 173–310. *Subject Headings:* **1. Oceanographic observation manuals 2. Oceanographic meteorology codes.**—*M.R.*

9E–136 551.46.018

Van Dorn, W. G., **Large-volume water samplers.** *American Geophysical Union, Transactions,* 37(6):682–684, Dec. **1956.** 3 figs. **DWB, DLC**—Two new sea-water samplers have been developed to collect water in larger volumes (one and 12 gal) than the conventional Nansen bottle. Both are constructed of plastic which is relatively inert chemically, are free-flushing, and can be either messenger- or bottom-actuated. *Subject Heading:* **1. Sea water samplers.**—*Author's abstract.*

9E–137 551.46

Yoshida, Kozo, **A note on the pressure changes of the two-layer ocean.** *Oceanographical Society of Japan, Tokyo, Journal,* 12(4):111–116, **1956.** 4 figs., 5 refs., 7 eqs. **DWB.** Also reprinted as *Tokyo. Univ. Geophysical Institute, Geophysical Notes,* 10(1):Contribution No. 2, **1957. DLC**—Time constants for the responses of the pressure changes of the stratified two layer ocean to the changes in winds applied at the ocean surface are examined. The dependence of the constants upon the scale, of time as well as of length, is discussed. The present note is only a preliminary one to further development which is intended for more practical connection with the problems in synoptic or descriptive oceanography. *Subject Heading:* **1. Pressure changes of two layer ocean.**—*Author's abstract.*

1957

9E–138 551.46(261)

Grousson, R. and Comolet-Tirman, A., **Hydrologie dans la partie orientale de l'Atlantique Nord.** [Hydrology of the eastern part of the North Atlantic.] *France. Comité Central d'Océanographie et d'Étude des Côtes, Bulletin d'Information,* 9(7):359–369, July/Aug. **1957.** 12 figs., table. **DWB, DLC**—Water temperature and salinity data obtained from a ship between Casablanca and Cape St. Vincent, and off Agadir (1955 and 1956) are presented in tables and vertical sections to depths of 2050 m. *Subject Headings:* **1. Ocean temperatures 2. Salinity 3. Eastern North Atlantic.**—*G.T.*

9E–139 551.46:550.3:061.3

†Gunter, Dietrich, **Ozeanographische Probleme der deutschen Forschungsfahrten im Internationalen Geophysikalischen Jahr 1957/1958.** [Oceanographic problems to be investigated on the German research cruises during the International Geophysical Year 1957/1958.] *Deutsche Hydrographische Zeitschrift,* Hamburg, 10(2):39–61, **1957.** 15 figs., 30 refs. **DWB, DLC**—Plans of German participation in one of the oceanographic operations of the IGY, operation "Polar Front Survey," are outlined. The sector assigned to Germany (participating with two research ships) is between 20°W and 45°W, and between Denmark Strait and the Azores. Bottom topography, subsurface, deep-water and bottom circulation will be investigated. Present knowledge about these factors is reviewed thoroughly. *Subject Headings:* **1. IGY oceanography program 2. German participation in IGY.**—*G.T.*

9E–140 551.46:016

†Japanese National Commission for UNESCO, **Oceanographic papers in Japan: annotated bibliography, 1873–1938.** Pub. **1957.** 235 p. **DWB**—Japanese literature on oceanography published through 1938 (1658 items) is listed chronologically, and indexed by author and under the following subject categories: 1) wave, 2) long wave, 3) tide, 4) current, 5) hydrography, 6) properties of sea water, 7) instrument, 8) chemistry, 9) geology, 10) submarine topography, 11) general oceanography and 12) miscellaneous. *Subject Headings:* **1. Oceanography bibliographies. I. Hidaki, Koji** (*comp.*).—*G.T.*

9E–141 551.464(267.4)

LaFond, E. C. (*Andhra Univ., Waltair*), **Sea water density at four stations on the east coast of India.** *Indian Journal of Meteorology and Geophysics,* Delhi, 8(2):213–217, April **1957.** 2 figs., 9 refs. **DWB, DLC**—Graphs show annual cycle of sea surface water density as a function of temp. and salinity for 4 stations on the East coast of India (Saugor Island, Waltair, Madras Harbour and Mandapam). Indications are that salinity is 4 to 7 times as important as temperature in determining the density of the water in the Bay of Bengal, and the salinity changes are controlled by the seasonal current system, which is a result of influx of fresh water from the rivers during the rainy season and of high salinity waters during the NE current season. The season of minimum density occurs later to the south than north. *Subject Headings:* **1. Sea water density region 2. Salinity data 3. Bay of Bengal 4. East Coast, India.**—*M.R.*

9E–142 551.463:551.464(267.4)

*LaFond, E. C. and Sivarama Sastry, J. (*both, Andhra Univ., Waltair*), **Turbidity of waters off the east coast of India.** *Indian Journal of Meteorology and Geophysics,* Delhi, 8(2):183–192, April

1957. 14 figs., table, 4 refs. **DWB, DLC**—Turbidity is proposed as one of the conservative properties of a water mass and a tracer or indicator of the mixing process. An attempt is made to describe and explain the vertical and horizontal circulation and structure of the water masses off the East Coast of India after rainstorms, and from season to season, on the basis of turbidity measurements to 20 m depth in 1955 and 1956. The hydrophotometer used, operations in making readings from the deck of the cruise ship, data obtained on the diurnal and seasonal variations, etc., are shown in illustrations and cross sections. *Subject Headings:* **1. Turbidity measurements of ocean water 2. Hydrophotometer readings 3. East Coast, India.**—*M.R.*

9E–143 551.46(266)

*Love, Cuthbert M. (*comp.*) **Physical and chemical data, Gulf of Alaska, spring and summer 1956 and spring 1957.** Washington (State). Univ. Dept. of Oceanography, Contract Nonr-477(10) and Contract Nonr-477(01), Technical Report, No. 56, Sept. **1957.** 90 p. 2 figs. almost entirely tables. **DWB**—This report presents physical and chemical data collected in the Gulf of Alaska during the spring and summer of 1956 and in the spring of 1957. Observations were made during three cruises of the research vessel "Brown Bear" of the Univ. of Washington, Dept. of Oceanography. Charts show the positions of stations sampled. Tables give values, over a range of selected depths, for temperature, salinity, density, dissolved oxygen, and dissolved inorganic phosphate. *Subject Headings:* **1. Oceanographic data 2. Gulf of Alaska.**—*Author's abstract.*

9E–144 551.463(265/266)

Muromtsev, A. M., **Novye karty raspredeleniia solenosti i plotnosti na poverkhnosti Tikhogo okeana.** [New charts of the salinity and density distribution on the surface of the Pacific Ocean.] *Meteorologiia i Gidrologiia*, Leningrad, No. 4:15–19, April **1957.** 6 figs., ref. **DWB, DLC**—The salinity of the South Pacific Ocean is based upon approximately 800 observations made during special expeditions and about 150 incidental observations on the surface of the ocean made during the interval 1874–1951. Feb. is taken as characterizing the summer season in the southern Pacific Ocean. A map showing the distribution of salinity on the surface of the South Pacific during the southern summer and graphs illustrating the annual variation of water density at the ocean surface in the southern part of the Kurile region, in the region east and south of Japan, and in the California coastal region, and a map showing the distribution of water density in the Southern Pacific for the southern summer and southern winter are presented. These maps are compared with those prepared by SCHOTT. *Subject Headings:* **1. Salinity distribution 2. Ocean density distribution 3. Pacific.**—*I.L.D.*

9E–145 551.524.4:551.526.6

Nagayama, M., **The heat budget of the Eastern China Sea.** *Journal of Meteorological Research*, Tokyo, 9(2):67–75, March **1957.** 10 figs., 3 tables, 18 refs., 11 eqs. In Japanese, English summary p. 67. **DWB, DLC.** Also reprinted with original paging in: *Oceanography and Meteorology*, Nagasaki, Japan, 8(1/2), Paper 1, Dec. **1957.** 10 figs., etc. **DWB**—In this paper, the heat budget of the Eastern China Sea is studied from consideration of the heat absorbed by the sea water through the sea surface (Q_n) and the heat added to the water column through advective process (Q_v). The main results obtained are as follows: 1) Q_n in winter has minus sign in the whole area of the Eastern China Sea, amounting to as much as $-400 \sim -600$ g cal/cm² day in the Kuroshio warm current region, while it has plus sign in the whole area of the Sea in summer, especially large in the continental shelf. 2) The seasonal variation of Q_v per unit volume of water is larger in the continental shelf than in the warm current region. It is considered that the cause of this fact depends mainly upon the influence of inflow of continental rivers. 3) The Eastern China Sea is divided into the warm water mass and cold water mass region by drawing the distribution-chart of annual mean amount of Q_v. In the chart, zero calorie line of Q_v coincides fairly well with the region where generally mixing of the two water masses is expected to occur. 4) When the water column, lying at first at the station, 24°45′N, 123°05′E (the center of the Kuroshio current), moves north-eastward, and reaches the station, 28°47′N, 127°50′E, the temperature change ($\Delta\theta$) of the water column is calculated by using the equation involving three factors—Q_n, lateral and vertical eddy conductivity. The value of calculated $\Delta\theta$ coincides well with the observed value in winter, in which vertical mixing takes place to the deep layer compared with other seasons. *Subject Headings:* **1. Heat exchange sea-atmosphere 2. Sea temperature budget 3. Kuroshio Current 4. East China Sea.**—*Author's abstract.*

9E–146 551.464:551.5

Poornachandra Rao, C. (*Forecasting Off., Airport, Madras*), **Meteorological factors affecting the salinity of surface sea water off Waltair.** *Indian Journal of Meteorology and Geophysics*, Delhi, 8(3):347–349, July **1957.** fig. **DWB, DLC**—Wind, rain and runoff and the inland mean air temperature are the variables most highly correlated with salinity of off-shore waters. Salinity of sea

near Waltair can be predicted from regression equation $Y = 32.59 + 0.35\,W - 0.0016_R$, where Y is salinity (in miles), $W = SW$ component of wind (in mph), for previous 24 hours, and R = precipitation since the first of the calendar year (in inches). Meteorological data for Vizaghapatam aerodrome and oceanographic data for a point 10 mi east of the observatory for 1954 were used in the analysis. *Subject Headings:* **1. Salinity forecasts for coastal waters 2. Weather effects on salinity of sea 3. Bay of Bengal.**—*M.R.*

9E–147 551.526.6:551.464(261)

Rodewald, M., **Schwankungen der Wassertemperatur im westlichen Nordatlantik.** [Variations of water temperature in the western North Atlantic.] *Wetterlotse*, No. 111:10–14, Jan. **1957.** 2 figs., table. **DLC**—On Dec. 8 and 18, 1956 in the same place in N. Atlantic, a ship reported different sea temperatures with similar weather. Sea temperature at O.W.S. "D" is plotted Nov. 13–Dec. 15, showing clear warm and cold periods. These are attributed to wandering tongues of warm Gulf Stream and cold Labrador Current water, which can apparently persist for several days. *Subject Headings:* **1. Sea temperature variations 2. North Atlantic.**—*C.E.P.B.*

9E–148 550.387

Ryzhkov, Iu. G., **Izmerenie elektricheskogo toka v okeane.** [Measurement of electric current in the ocean.] *Akademiia Nauk SSSR, Doklady*, 113(4):787–790, **1957.** 5 refs., eqs. **DLC**—The existence of telluric currents in the oceans was known since 1933. It was assumed that these currents cause the eccentric location of the magnetic poles. A number of measurements were made during the Soviet Antarctic Expedition in 1955/56, both in the Antarctic sea ice and in the Indian Ocean. Values from 4.2 to 55.0 mv/km were found increasing with depth and decreasing with latitude. Direction of the currents vary from 267 to 343°. *Subject Headings:* **1. Telluric currents 2. Geomagnetism 3. Antarctic Ocean 4. Indian Ocean.**—*A.A.*

9E–149 551.463

*Schell, Irving I., **Gaining a better understanding of the representativeness of sea surface temperature observations and of the density of these observations for research purposes.** *Tufts Univ., Meteorological Studies*, No. 57-2, July **1957.** 19 p. 3 tables, 8 refs. "Research done under Contract Cwb-9011. Unpublished ms." **DWB**—An analysis was made of three pairs of historical series of mean monthly sea surface temperatures in the North Atlantic—one from the tropical area: 15°–20°N, 60°–65°W, dominated by the North Equatorial Current; the second from the semitropical area: 30°–35°N, 55°–60°W, by the Gulf Stream; and the third pair from the polar area: 45°–50°N, 45°–50°W off Newfoundland, by the Labrador Current. The results obtained show: 1) the mean decadal temperature (midpoint to midpoint of decade) to have dropped approximately uniformly in all three areas to its lowest value in the decade 1916–1925, rising thereon to its highest value in the decade 1936–1945 or 1946–1955; 2) by successively eliminating values with few observations per month, the standard deviation, σ, tends to become relatively constant and may then serve as a criterion of the representativeness of sea surface temperature data; and 3) lower (higher) air and sea temperatures tend to be associated with higher (lower) wind speeds and air and sea temperatures tend to vary together. *Subject Headings:* **1. Sea surface temperature observations 2. North Atlantic.**—*Author's abstract.*

9E–150 551.46

Simonov, A. I., **O rezhime vzveseĭ na vzmor'e Kubani.** [The regime of suspended matter in the Kuban Gulf.] *Meteorologiia i Gidrologiia*, Leningrad, No. 5:40–42, May **1957.** 2 figs., table, 2 refs. **DWB**—Data are presented on the variation of current velocity in the Kuban Gulf, turbidity etc., in various parts of the Gulf. The relationship between turbidity and transparency is parabolic. Determining the parameter K for loads with different particle sizes, which vary with time for one river and are not uniform for all rivers, provides information concerning the regime of turbidity and velocity of river currents in a gulf by determining the transparency of the water. *Subject Headings:* **1. Sea water turbidity-transparency relationships 2. Kuban Gulf.**—*I.L.D.*

9E–151 551.463(261)

Skriptunova, L. I., **O roli teplovogo balansa poverkhnosti v rezhime temperatury vody v severnoĭ chasti Atlanticheskogo okeana.** [The role of surface heat balance in the temperature regime of the waters of the northern Atlantic Ocean.] *Meteorologiia i Gidrologiia*, Leningrad, 7:40–45, July **1957.** 3 figs., 2 tables, 13 refs., 4 eqs. **DWB, DLC**—Since insufficient data are available to determine directly the temperature regime of the northern Atlantic, the author attempts to solve the problem indirectly by computing only the heat balance of the ocean surface and comparing the results of the calculations with observed temperature variations. The heat balance of the ocean surface was calculated for the area between 35° and 60°N lat. from the data provided in W. F. McDonald's

atlas. In order to compare variations in water temperature for small time intervals with the hea balance of the ocean surface for the same time the heat balance was computed from the data of weather ships for the period 1954–1955. The radiation balance was calculated by the metho developed by M. I. BUDYKO. Evaporation and heat exchange were computed indirectly from th vertical distribution of moisture over the oceans. V. V. SHULEĬKIN's formula for evaporatio $W = A(E-e)v$ is used by transforming it into the form

$$w = a \sum \frac{dc}{D_0} (E-e)v,$$

where D_0—atmospheric moisture deficit in mb calculated from

$$D = 12 \frac{\sqrt{10e+0.2I-4N}}{1+0.4N-0.02I}$$

and ∂_s—atmospheric moisture deficit obtained from ship observations. Turbulent exchange betwee ocean and atmosphere is calculated by the formula

$$P = e_p A v (t_w - t_a).$$

A map showing the distribution of d_s/D_0 over the northern Atlantic Ocean during winter and summe numerical data giving the heat balance of the ocean surface (in kg cal/cm²) and computed and ob served water temperatures, and graphs showing the relationship of depth of convective mixing ar magnitude of heat loss through the ocean surface are presented. It is concluded that in tho regions of the Atlantic Ocean where horizontal temperature gradients are small, the surface hea balance of the ocean plays a fundamental role in the temperature changes of the cold part of th ocean. *Subject Headings:* **1. Heat balance of ocean 2. North Atlantic.**—*I.L.D.*

9E–152 551.46.0

Uusitalo, S. (*Inst. of Marine Res., Helsinki*), **On the interpretation of bathythermogram** *Geophysica*, Helsinki, 5(3):134–138, **1957.** 3 figs., 8 eqs. **DLC**—The bathythermographic ter perature measurements from a stationary ship show, to a certain extent, erroneous values due to th slowness of the instrument. These may be corrected by means of the following method, using t two curves produced when the instruments are lowered and hoisted respectively. *Subject Headin* **1. Bathythermograms.**—*Author's abstract.*

9E–153 551.

Woods Hole Oceanographic Institution, **Experimental physical oceanography.** Contra Nonr-1831(00), Contract NT-083-107, (Report), 57-47, Jan. 1–Aug. 31, 1957, issued Aug. 195 "Unpubl. ms." 23 p. 5 figs. **DWB** (551.46 W894e)—This report covers studies of the ocean circulation, of atmospheric circulation, of thermal convection and of optical devices for meteor logical research. Models and equipment are illustrated. *Subject Headings:* **1. Physical ocea ography research 2. Oceanic circulation studies 3. Atmospheric optics equipment.**—*M.R.*

SUPPLEMENTARY MATERIAL

9E–154 551.501.4:551.46(0

LaFond, E. C. (*U. S. Navy Electronics Lab.*), **Processing oceanographic data.** *U. S. Hyd graphic Office, Publication*, No. 614, **1951.** 114 p. 27 figs., 20 tables, 29 refs., eqs. **DLC**—Nom grams, tables and instructions for working up oceanographic records (such as bathythermogra are collected in this manual. Temperature, salinity, conductivity, and specific volume (and ano aly) computations are considered very thoroughly. Practical examples are given for every step processing. The work of preparing this and companion volumes is being done under the gene direction of H. U. SVERDRUP of the Norsk Polarinstitutt. *Subject Headings:* **1. Oceanographic d processing 2. Computation tables 3. Manuals.**—*M.R.*

9E–155 551.526.6:551.464(2

Nagai, M., **On the annual variation of sea water temperature and chlorinity at Gotona** *Journal of Meteorological Research*, Tokyo, 4(12):951–958, March **1953.** 4 figs., 3 tables, 6 refs. Japanese. English summary p. 59. **MH-BH**—Correlation between 10-day means of sea surf temperature and chlorinity west of Kyushu is negative. Variations are due to: heat excha between sea and air, evaporation and precipitation; and heat advection. When advection eliminated, correlation becomes positive. *Subject Headings:* **1. Sea surface temperature 2. Salin 3. East China Sea.**—*C.E.P.B.*

9E–156 551.463:535.3(261,264,265/266,267)

Phosphorescence [in] North Atlantic Ocean; Gulf of Guinea; Arabian Sea; Indian Ocean; South Pacific Ocean; Java Sea. *Marine Observer*, London, 25(170):208–210, Oct. **1955.** Also: **Phosphorescence [in] Atlantic Equatorial waters, Gulf of Guinea, Gulf of Aden, Arabian Sea.** Also: **Phosphorescence seen in the air, Arabian Sea.** *Ibid.*, 25(169):147–149, July **1955.** Also: **Phosphorescence [in] Gulf of Aden, Strait of Hormuz, Gulf of Siam, Western Pacific Ocean. Phosphorescence seen in the air [in] Gulf of Aden. Phosphorescent wheels [in] Persian Gulf, Gulf of Oman.** *Ibid.*, 26(172):77–80, April **1956.** 4 figs. **DLC**—In the first of these groups of articles, several reports describe widespread phosphorescence, others refer to phosphorescent bands, patches, and flashes apparently 3–4 ft under water. The Gulf of Guinea report states that balls of phosphorescence, about 1½ ft diameter, passed down the sides of the ship. In the third of these groups of articles, four occurrences of phosphorescence under or on the sea surface are reported, one (15°N, 133°E) commencing to flash vividly as a rain squall approached but one ceasing when the squall reached the ship. In the Gulf of Aden pulsating waves of light (period 1.5 sec) extended to about 12 ft above the sea. Several revolving phosphorescent wheels in the Persian Gulf and Gulf of Oman are described and illustrated. *Subject Headings:* **1. Phosphorescence 2. Atlantic Ocean 3. Pacific Ocean 4. Arabian Sea 5. Indian Ocean.**—*C.E.P.B.*

9E–157 551.46:06(082.1)

California. Univ. Scripps Institution of Oceanography, La Jolla, **Contributions, 1955.** issued July **1957.** 1112 p. More than 75 reprints of Contributions from the Scripps Institution of Oceanography which appeared during 1955 in publications other than its Bulletin and its Records of Observations. figs., tables, refs. **DWB**—About a score of articles of interest to meteorologists in the field of physical oceanography published by members of the staff of Scripps Institution of Oceanography during 1955 are reprinted in this huge volume. The remainder of the 75 contributions are in the area of marine biology. For listing of articles of interest in meteorology, *see* Pt. III, June **1958**, *MAB*. These articles abstracted separately. *Subject Heading:* **1. Oceanographic reprint collections.**—*M.R.*

9E–158 551.464:546.21

*Nagai, Masao (*Nagasaki Marine Observatory*), **A note on the annual variation of dissolved oxygen in sea water, Pt. 1.** *Oceanographical Society of Japan, Journal*, 11(2):63–68, Aug. **1955.** 3 figs., 5 tables, 4 refs., 10 eqs. In Japanese; English summary p. 63. **DWB**—In temperate latitudes, the oxygen content of sea water near the surface varies with seasons. This occurs since the solubility of oxygen in sea water changes with water temperature and further since the production and utilization of oxygen by organisms are not equal in different seasons. A. C. REDFIELD estimated the exchange of oxygen across the sea surface (ΔQ_E) and the net production of oxygen by organisms (ΔQ_X) during the period of observations. He concluded that ΔQ_X is equal to two fifths of ΔQ_E using the data of oxygen content in the waters of the Gulf of Maine. In the present paper the author has made an attempt to determine the magnitude of ΔQ_E and ΔQ_X in Gotonada Bay, Japan pointing out the error of Redfield's estimation. (For Pt. 2, *see* 9E–91.) *Subject Headings:* **1. Oxygen variation in sea water 2. Sea water composition.**—*Author's abstract.*

PART III. REVIEWS, TRANSLATIONS, RECENT MONOGRAPHS, AND ANALYTICS FROM SERIALS AND COLLECTED WORKS

Note: Material listed in these sections will not be included in the monthly indexes until abstracted. The item number is mentioned for those titles which have been abstracted in previous issues of **Meteorological Abstracts and Bibliography.**

A. REVIEWS OF IMPORTANT METEOROLOGICAL MATERIAL

Abetti, Giorgio: **The sun.** Trans. by J. B. Sidgwick. London, Faber & Faber, 1957. 336 p. 112 plates and 97 figs. Price, 63 sh. Review in *Science Progress*, London, 45(180):709–710 Oct. 1957.

Aller, Laurence Hugh: **Gaseous nebulae,** Vol. 3. London & Hall, 1956. 322 p. Price, 53 sh. (International Astrophysics Series.) Review by S. S. Banerjee in *Journal of Scientific and Industrial Research, Ser. A*, Delhi, Vol. 15, No. 11:521, Nov. 1956.

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Azzi, Girolamo: **Agricultural ecology.** London, Constable, 1956. 424 p. Price, 45 sh. Review by A. D. Bradshaw in *Nature*, London, 181(4607):443, Feb. 15, 1958.

Balmer, Heinz: **Beiträge zur Geschichte der Erkenntnis des Erdmagnetismus** [Contribution to the history of the knowledge of terrestrial magnetism]. Aarau, Switzerland, Verlag Sauerländer 1956. 891 p. 45 figs. Price, DM 30,00. Review by K. Burkhart in *Die Umschau*, Frankfurt, a.M., 57(17):541, Sept. 1, 1957.

Caborn, J. M.: **Shelter belts and microclimate.** *Great Britain. Forestry Commission, Bulletin* No. 29, pub. H.M. Stationery Office, 1957. Review in *Nature*, London, 181(4603):160–161 Jan. 18, 1958.

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Coutrez, Raymond: **Radioastronomie** [Radioastronomy]. Uccle, Edition du Patrimoine de l'Observatoire Royal de Belgique, 1956. 383 p. 170 figs. Review by P. ten Bruggencate in *Die Naturwissenschaften*, Berlin, 44(17):476, Sept. 1, 1957.

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Heupke, Wilhelm; Kühnau, J. and Schliephake E.: **Ergebnisse der physikalisch-diätetischen Therapie** [Results of physical-dietetic therapy]. Dresden and Leipzig, Verlag Th. Steinkopf 1955. 464 p. 166 figs. Price, DM 39.50. Review by W. Mörikofer in *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 7(3/4):485–486, 1956.

Hermes, Karl: **Die Lage der oberen Waldgrenze in den Gebirgen der Erde und ihr Abstand zur Schneegrenze** [Position of the upper forest limit in the mountains of the world and its distance from the snow line]. *Kölner Geographische Arbeiten*, No. 5, 1955 (pub. by Geographisches Institut der Universität). 277 p. 4 plates. Price, DM 9. Review by W. Klaer in *Petermanns Geographische Mitteilungen*, Gotha, 10(4):280, 1957.

Höfling, Oskar: **Wetterkunde und Astronomie** [Meteorology and astronomy]. Bonn, Ferd. Dümmlers Verlag, 1955. 48 p. 32 figs. Price, DM 1,50. "Reprint from Lehrbuch der Physik, Mittelstufe, Ausg. A." Review in *Die Umschau*, Frankfurt, a.M., 57(16):510, Aug. 15, 1957.

Hutchinson, George Evelyn: **A treatise on limnology, Vol. 1, Geography, physics and chemistry.** N. Y., Wiley; London, Chapman and Hall, 1957. 1015 p. illus. Price, $19.50. Review by Arthur D. Hasler in *Science*, Wash., D. C., 127(3289):88, Jan. 10, 1958.

Koschmieder, Harald: **Elementare Theorie der Linienböen und Schlotsströmungen** [Elementary theory of line squalls and chimney currents]. *Flugmeteorologische Forschungsarbeiten*, No. 1, pub. 1953. 88 p. Price, DM 14.00. Review by H. Koppe in *Zeitschrift für Flugwissenschaften*, Brunswick, 2(11):306–307, Nov. 1954.

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B. TRANSLATIONS AND RECENT MONOGRAPHS

TRANSLATIONS

Berliand, T. G.: **Zonal distribution of the flow of total solar radiation reaching the earth's surface.** (Trans. into English of the original Russian, **Zonal'noe raspredelenie potokov summarnoĭ solnechnoĭ radiatsii, postupaiushcheĭ k zemnoĭ poverkhnosti,** in *Meteorologiia i Gidrologiia*, Leningrad, No. 9:22–25, Sept. 1956. 2 figs., table, 4 refs.) Trans. available for reference, DWB (M21.1 B514z).

Dirks, W.: **New low-temperature batteries for radiosonde service.** (Trans. into English of original German, **Neue Kältebatterien für den Radiosonden-Dienst,** in *Die Technik*, 9:161–164, 1954) Trans. (13 p.) available as ASTIA AD-137-532, issued 1956.

Dobryshman, E. M.: **Zonal distribution of humidity in the troposphere.** (Trans. into English from original Russian, **O zonal'nom raspredelenii vlazhnosti v troposfere,** in *Meteorologiia i Gidrologiia*, No. 12:18–25, Dec. 1956. 6 figs., 3 refs., 13 eqs.) Trans. (13 p.) available for reference, DWB (M10.52 D634zo). (*For abstract on original Russian, see* 9.4–116, April 1958, *MAB*)

Drogaĭtsev, D. A.: **Calculation of the vorticity of tangent friction of wind over the sea.** (Trans. into English of original Russian, **Raschet zavikhrennosti kasatel'nogo treniia vetra nad morem,** in *Meteorologiia i Gidrologiia*, Leningrad, No. 5:15–21, Sept./Oct. 1955. 4 figs., table, 3 refs., 13 eqs.) Trans. available for reference, DWB (M01.4 D784c).

Feĭgel'son, E. M.: **Calculation of the water content of clouds from their scattering characteristics.** (Trans. into English from original Russian, **Opredelenie vodnosti oblakov po ikh rasseivaiushcheĭ sposobnosti,** in *Akademiia Nauk SSSR. Geofizicheskiĭ Institut, Trudy*, No. 23(150):92–195, 1954. 2 figs., 3 refs., 31 eqs.) Trans. available for reference, DWB (M08.765 F433ca).

Fel'dman, Ia. I.: **Some results of microclimatic investigations in the Caspian Plain.** (Trans. into English of original Russian, **Nekotorye rezul'taty mikroklimaticheskikh issledovaniĭ v Prikaspiĭskoĭ Nizmennosti,** in Akademiia Nauk SSSR. Institut Geografii (and) Institut Lesa, **Mikroklimaticheskie i klimaticheskie issledovaniia v Prikaspiĭskoĭ Nizmennosti.** Moscow, 1953. p. 42–53. figs., refs.) Trans. available Commonwealth Scientific and Industrial Research Organization, Information Service, 314 Albert Street, E. Melbourne C.2, Victoria, Australia, as its Trans., CSIRO-3190. (*See* 6.11–333, Nov. 1957, *MAB*)

Ferraguti, Mario and Marimpietri, Luigi: **Improvement of rain making rockets.** (Translation into English of original Italian, **Perfezionamento nei razzi,** Patent No. 492559, March 27, 1954.) Trans. (5 p.) available as ASTIA AD-128-670.

Gavrilov, V. A.: **Diaphonoscopic method of determining meteorological visibility distance at hydrometeorological stations.** (Trans. into English from original Russian, **O diafanoskopicheskom metode opredeleniia meteorologicheskoĭ dal'nosti vidimosti na gidrometeorologicheskikh stantsiiakh,** in *Meteorologiia i Gidrologiia*, No. 9:45–48, Sept. 1956.) Trans. available for reference DWB (M08.92 G2836d).

Gedeonov, L. I.: **Radioactive contamination of the atmosphere.** (Trans. into English of original Russian, **Radioaktivnoe zagriaznenie atmosfery,** in *Atomnaia Energiia*, Moscow, 2(3):260–271, March 1957. 8 figs., 75 refs.) Trans. in *Soviet Journal of Atomic Energy* (issued by Consultants Bureau, Inc., N. Y.), 2(3):313–325, 1957. Available for reference, DLC. (*See* 9C–41, March 1958, *MAB*)

Gershman, B. N. and Ginzburg, V. L.: **Mechanism of the occurrence of ionospheric discontinuities.** (Trans. into English of original Russian, **O mekhanizme vozniknoveniia ionosfernykh neodnorodnosteĭ,** in *Akademiia Nauk SSSR, Doklady*, 100:647–650, 1955.) Trans. available as ASTIA-AD-137-539, issued 1957. Available for loan, Special Libraries Association, Translation Center (John Crerar Library, Chicago), as its R-1919.

Hofmann, Gustav: **Thermodynamics of dew formation.** (Trans. into English of original German **Die Thermodynamik der Taubildung,** in *Germany. Deutscher Wetterdienst, Berichte,* 3(18) 1955. 45 p. 13 figs., 7 tables, 126 refs., 67 eqs.) Trans. available as CSIRO-2912. (*See* 7.5–201, May 1956, *MAB*)

Isaev, S. I.: **Certain features of the auroral displays in various zones.** (Trans. into English of original Russian, **Nekotorye osobennosti proiavleniia poliarnykh siianiĭ v razlichnykh zonakh** in *Problemy Arktiki,* 10(11):21–30, 1939.) Trans. available as ASTIA, AD-128-315.

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Mäde, A.: **Basket-shield for the platinum resistance thermometer of the National Weather Service** (Trans. into English of original German, **Ein Schutzkorb für das Platin-Widerstandsthermometer des Reichswetterdienstes,** in *Meteorologische Zeitschrift,* 55:415–417, 1938. 2 figs. Trans. available as CSIRO 3199.

RECENT MONOGRAPHS

Belgian Congo. Service Météorologique: **Annuaire Météorologique du Congo Belge et du Ruanda-Urundi, 1957** [Meteorological Annual of the Belgian Congo and of Ruanda-Urundi, 1957] *Belgium. Académie Royale des Sciences Coloniales, Classe des Sciences Techniques, Mémoires in* 8°, n.s., 6(4), 1957. 167 p. numerous tables.

Bonnen, C. A.; McArthur, W. C.; Magee, A. C. and Hughes, W. F.: **Use of irrigation water on the high plains.** *Texas. Agricultural Experiment Station, Bulletin,* No. 756, Dec. 1952. 43 p. 13 tables, 7 figs.

Bruin, Jack and Hudson, H. E., Jr.: **Selected methods for pumping test analysis.** *Illinois. State Water Survey Div., Report of Investigation* No. 25, 1955. 54 p. 20 figs., 6 tables, 25 refs., eqs.

Buskirk, Elsworth R. and Bass, David E.: **Climate and exercise.** *U. S. Quartermaster Research & Engineering Center, Natick, Mass. Environmental Protection Research Div., Technical Report* EP-61, July 1957. 32 p. 7 figs., 3 tables, 57 refs.

Erbe, Jost: **Untersuchungen zur Bestimmung des Wasservorratsänderungs-Gliedes in der Wasserbilanzgleichung durch Messungen des Grundfeuchte- und Grundwasserganges** [Investigations on the determination of the water storage change factor in the water balance equation on the basis of measurements on soil moisture and ground water conditions]. *Deutsches Gewässerkundliches Jahrbuch, Besondere Mitteilungen,* No. 21, 1957. 97 p. 15 figs. (some fold.), 11 tables, 98 refs.

Hanson, Ross: **Groundwater resources in Lee and Whiteside Counties.** *Illinois. State Water Survey Div., Report of Investigation,* No. 26, 1955. 67 p. 7 figs., tables.

Huff, F. A.; Hiser, H. W. and Stout, G. E.: **The October 1954 storm in northern Illinois.** *Illinois State Water Survey Div., Report of Investigation,* No. 27, 1955. 23 p. 16 figs. (incl. photos) 2 tables, 11 refs., 3 eqs.

Illinois. State Water Survey Div.: **Potential water resources of Southern Illinois.** Its *Report of Investigation,* No. 31, 1957. 97 p. 48 figs., 41 tables, 34 refs.

Lane, H. C.: **Simulated hail damage to cotton, 1955–1956.** *Texas. Agricultural Experiment Station, College Station, Progress Report,* No. 1953, April 24, 1957. 6 p. 9 tables.

Lugeon, Jean: **Les buts scientifiques de l'Expédition Radiométéorologique Polaire Suisse pendant l'Année Geophysique Internationale.** [Scientific purposes of the Swiss Polar Radiometeorological Expedition during the International Geophysical Year]. Reprint No. 20, from *La Suisse Horlogère,* May 16, 1957. 16 p. 28 figs. (incl. photos).

Mathur, Prem N. and Mueller, Eugene A.: **Radar back-scattering from non-spherical scatterers Pt. 1, Cross-sections of conducting prolates and spheroidal functions, Pt. 2, Cross-sections from non-spherical raindrops.** *Illinois. State Water Survey Div., Report of Investigation* No. 28, 1955. 85 p. 33 figs., 23 tables, 17 refs., 49 eqs.

Nelson, Gerald H.: **Bubbler system instrumentation for water level measurement.** *Illinois. State Water Survey Div., Report of Investigation,* No. 23, 1954. 30 p. 28 figs. (incl. photos), 3 tables 6 eqs.

Nelson, Ronald A.: **Analogs of Yuma climate in East Central Africa.** *U. S. Quartermaster Research and Development Center. Environmental Protection Research Div., Yuma Analogs,* No. 7, Apr. 1956. 16 p. 12 figs., 10 tables, 18 refs.

Rossi, Veikko: **Land- und Seewind an den finnischen Küsten** [Land and sea wind on the Finnish coast]. *Finland. Ilmatieteellinen Keskuslaitos, Toimituksia,* No. 41, 1957. 17 p. 6 tables 5 figs., 6 refs.

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World Meteorological Organization. Commission for Climatology: **Abridged final report of the Second Session, Washington, Jan. 14–25, 1957.** *World Meteorological Organization, WMO*, No. 62. R.P.25, 1957. 61 p.

C. METEOROLOGICAL ARTICLES APPEARING IN RECENTLY ISSUED PUBLICATIONS

American Geophysical Union, Transactions, Vol. 39, No. 1, Feb. 1958

Wolman, M. Gordon and Eiler, Jack P.: **Reconnaissance study of erosion and deposition produced by the flood of August 1955 in Connecticut,** p. 1–14

Linsley, Ray K.: **Correlation of rainfall intensity and topography in Northern California,** p. 15–18

Brewer, Max C.: **Some results of geothermal investigations of permafrost in Northern Alaska,** p. 19–26

Haubrich, Richard A.; Rose, John C. and Woollard, G. P.: **A method for the measurement of absolute gravity,** p. 27–34

Hall, Donald H.: **Least squares in magnetic and gravity interpretation,** p. 35–39

Namias, Jerome: **Synoptic and climatological problems associated with the general circulation of the Arctic,** p. 40–51

Brooks, Charles F. and Brooks, Eleanor S.: **The accuracy of wind-speed estimates at sea,** p. 52–57

Wilkins, Eugene M.: **Effective coefficients of diffusivity for atomic bomb clouds at one thousand to two thousand miles,** p. 58–59

Wilkins, Eugene M.: **Precipitation scavenging from atomic bomb clouds at distances of one thousand to two thousand miles,** p. 60–62

Tanner, C. B. and Suomi, V. E.: **A max-min dew-point hygrometer,** p. 63–66

De Josselin De Jong, G.: **Longitudinal and transverse diffusion in granular deposits,** p. 67–74

Remson, Irwin and Randolph, J. R.: **Application of statistical methods to the analysis of ground-water levels,** p. 75–83

Swartzendruber, D. and Huberty, M. R.: **Use of infiltration equation parameters to evaluate infiltration differences in the field,** p. 84–93

Kazmann, Raphael G.: **Problems encountered in the utilization of ground-water reservoirs,** p. 94–99

Potter, W. D.: **Upper and lower frequency curves for peak rates of runoff,** p. 100–185

Press, Frank; Ewing, Maurice and Lehner, Francis: **A long-period seismograph system,** p. 106–108

Snodgrass, Frank E.: **Shore-based recorder of low-frequency ocean waves,** p. 109–113

Snodgrass, F.; Munk, W. and Tucker, M. J.: **Offshore recording of low-frequency ocean waves,** p. 114–120

Gerharz, Reinhold: **A fluid level sensing device of simple design,** p. 121–122

Philip, J. R.: [**Discussion of**] **W. A. Hall: Permeability and infiltration relationships in one dimensional infiltration in a uniform soil,** p. 123–124

Chow, Ven Te and Kraijenhoff van de Leur, D. A.: [**Discussion of**] **M. C. Boyer: A correlation of the characteristics of great storms,** p. 124–127

Bagnold, R. A.: [**Discussion of**] **Edwin F. Ford: Transport of sand by wind** [**and**] **Reply by Ford,** p. 127–128

Koffman, Louis A.: [**Discussion of**] **J. F. Miller and J. L. H. Paulhus: Rainfall-runoff relations for small basins** [**and**] **Reply by Miller and Paulhus,** p. 128–129

IGY Bulletin, No. 7, Jan. 1958, p. 159–174 [for titles in this section, see below under IGY Bulletin]

IGY Bulletin, No. 8, Feb. 1958, p. 175–194, [for titles in this section, see below under IGY Bulletin]

Bates, D. R., [ed.], **The earth and its atmosphere.** N. Y., Basic Books, 1957. 324 p.

Chapman, S.: **The International Geophysical Year,** p. 1–11
Kuiper, Gerard P.: **Origin, age and possible ultimate fate of the earth,** p. 12–30
Bullen, K. E.: **The deep interior,** p. 31–47
Wilson, J. Tuzo: **The crust,** p. 48–73
Deacon, G. E. R.: **The oceans,** p. 74–87
Vestine, E. H.: **Geomagnetic field,** p. 88–96
Bates, D. R.: **Composition and structure of the atmosphere,** p. 97–112
Eady, E. T.: **Climate,** p. 113–129
Eady, E. T.: **The general circulation of the atmosphere and oceans,** p. 130–151
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Selected bibliography, p. 303–308

IGY Bulletin, Wash., D. C., No. 7, Jan. 1958 [This Bulletin, issued by the National Academy of Sciences, appears as a section of the **American Geophysical Union, Transactions** 39(1):159–174, Feb. 1958]

Oceanographic Expedition Downwind, p. 159–162 [i.e., p. 1–4 of Reprint issue]
Polar ice and snow studies, p. 163–164 [i.e., p. 5–6]
Rocket flare patrol program, p. 165–167 [i.e., p. 7–9]
Davies, D. A.: **Microcard program for IGY meteorological data,** p. 167–169 [i.e., p. 9–11]
Ionospheric studies using earth satellites, p. 169–174 [i.e., p. 11–16]

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First sea surface gravimeter, p. 175–178 [i.e., p. 1–4 of Reprint issue]
A report on the United States program, p. 179–187 [i.e., p. 5–13]
Satellite telemetry, p. 187–192 [i.e., p. 13–18]
IGY satellite program notes, p. 192–193 [i.e., p. 18–19]
Thule neutron monitor station, p. 193–194 [i.e., p. 19–20]

International Geophysical Year, 1957/1958, Annals, Vol. 3, 1957 (Beynon, W. J. G. and Brown G. M., eds.: IGY instruction manual: the ionosphere)

Wright, J. W.; Knecht, R. W. and Davies, K. [comps.]: **Ionospheric vertical soundings** p. 1–167
General theory of ionospheric absorption, p. 177–178
Piggot, W. R.; Beynon, W. J. G. and Brown, G. M.: **The pulse reflection method of measuring ionospheric absorption,** p. 179–203
Ionospheric absorption and f-min, p. 204–206
Little, C. G.: **The measurement of ionospheric absorption using extra-terrestrial radio waves** p. 207–217
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